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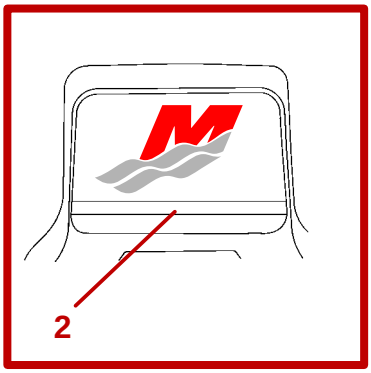
Identification Record

The serial numbers are the manufacturer's keys to numerous engineering details which apply to your Cummins MerCruiser Diesel® power package. When contacting Cummins MerCruiser Diesel about service, **always specify model and serial numbers**.



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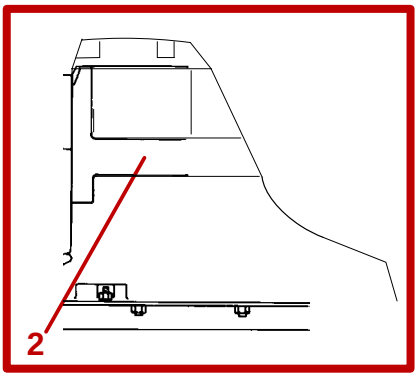

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Please record the following information:

1.

Engine Model and Horsepower	Engine Serial Number

2.

Transom Assembly Serial Number (Sterndrive)	Gear Ratio	Sterndrive Unit Serial Number

3.

Transmission Model (Inboard)	Gear Ratio	Transmission Serial Number

4.

Propeller Number	Pitch	Diameter

5.

Hull Identification Number (HIN)	Purchase Date

6.

Boat Manufacturer	Boat Model	Length

7.

Exhaust Gas Emissions Certificate Number (Europe Only)

The description and specifications contained herein were in effect at the time this guide was approved for printing. Cummins MerCruiser Diesel, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, or to change specifications or designs, without notice and without incurring obligation.

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Mercury Marine, Fond du Lac, Wisconsin, U.S.A. Printed in U.S.A.

WELCOME!

You have selected one of the finest marine power packages available. It incorporates numerous design features to assure operating ease and durability.

With proper care and maintenance, you will thoroughly enjoy using this product for many boating seasons. To ensure maximum performance and carefree use, we ask that you thoroughly read this manual.

The Operation, Maintenance, and Warranty Manual contains specific instructions for using and maintaining your product. We suggest that this manual remain with the product for ready reference whenever you are on the water.

Thank you for purchasing one of our Cummins MerCruiser Diesel products. We sincerely hope your boating will be pleasant!

Cummins MerCruiser Diesel

Warranty Message

The product you have purchased comes with a **limited warranty** from Cummins MerCruiser Diesel; the terms of the warranty are set forth in the **Warranty Sections** of this manual. The warranty statement contains a description of what is covered, what is not covered, the duration of coverage, how to best obtain warranty coverage, **important disclaimers and limitations of damages** and other related information. Please review this important information.

Read This Manual Thoroughly

IF YOU DON'T UNDERSTAND ANY PORTION, CONTACT YOUR DEALER FOR A DEMONSTRATION OF ACTUAL STARTING AND OPERATING PROCEDURES.

NOTICE

Throughout this publication, and on your power package, **WARNINGS** and **CAUTIONS**, accompanied by the International Hazard Symbol ⚠, may be used to alert the installer/user to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. **Observe them carefully.**

These Safety Alerts alone cannot eliminate the hazards that they signal. Strict compliance with these special instructions while performing the service, plus common sense operation, are major accident prevention measures.

⚠ WARNING

WARNING - Hazards or unsafe practices which could result in severe personal injury or death.

⚠ CAUTION

CAUTION - Hazards or unsafe practices which could result in minor personal injury or product or property damage.

IMPORTANT: - Indicates information or instructions that are necessary for proper operation and/or maintenance.

⚠ WARNING

The operator (driver) is responsible for the correct and safe operation of the boat, the equipment aboard and the safety of all occupants aboard. We strongly recommend that the operator read this Operation, Maintenance and Warranty Manual and thoroughly understand the operational instructions for the power package and all related accessories before the boat is used.

⚠ WARNING

California Proposition 65 Warning

The engine exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

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SECTION 1 - WARRANTY

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Warranty Information

Owner Warranty Registration

UNITED STATES AND CANADA ONLY

- It is important that your selling dealer fills out the Warranty Registration Card completely and mails it to the factory immediately upon sale of the new product.
- It identifies name and address of the original purchaser, product model and serial number(s), date of sale, type of use and selling dealer's code, name and address. The dealer also certifies that you are the original purchaser and user of the product.
- Upon receipt of the Warranty Registration Card at the factory, you will be issued a plastic Owner Warranty Registration Card which is your only valid registration identification. It must be presented to the servicing dealer should warranty service be required. Warranty claims will not be accepted without presentation of this card.
- A temporary Owner Warranty Registration Card will be presented to you when you purchase the product. It is valid only for 30 days from date of sale while your plastic Owner Warranty Registration Card is being processed. Should your product need service during this period, present the temporary registration card to the dealer. He will attach it to your warranty claim form.
- Because of your selling dealer's continuing personal interest in your satisfaction, the product should be returned to him for warranty service.
- If your plastic card is not received within 30 days from date of new product sale, please contact your selling dealer.
- The product warranty is not effective until the product is registered at the factory.
- NOTICE: Registration lists must be maintained by factory and dealer on marine products sold in the United States, should notification under the Federal Boat Safety Act be required.
- You may change your address at any time, including at time of warranty claim, by calling Mercury MerCruiser or sending a letter or fax with you name, old address, new address, and engine serial number to Mercury MerCruiser's warranty registration department. Your dealer can also process this change of information.

Mercury Marine
Attn: Warranty Registration Department
W6250 Pioneer Road
P.O. Box 1939
Fond du Lac, WI 54935-1939
Phone: 920-929-5054
Fax: 920-929-5893

International Owner Registration

OUTSIDE THE UNITED STATES AND CANADA

- It is important that your selling dealer fills out the Warranty Registration Card completely and mails it to the distributor or Marine Power Service Center responsible for administering the warranty registration/claim program for your area.
- The Warranty Registration Card identifies your name and address, product model and serial number(s), date of sale, type of use and the selling distributor's/dealer's code number, name and address. The distributor/dealer also certifies that you are the original purchaser and user of the product.
- A copy of the Warranty Registration Card, designated as the Purchaser's Copy, MUST be given to you immediately after the card has been completely filled out by the selling distributor/dealer. This card represents your factory registration identification, and should be retained by you for future use when required. Should you ever require warranty service on this product, your dealer may ask you for the Warranty Registration Card to verify date of purchase and to use the information on the card to prepare the warranty claim form(s).
- In some countries, the Marine Power Service Center will issue you a permanent (plastic) Warranty Registration Card within 30 days after receiving the Factory Copy of the Warranty Registration Card from your distributor/dealer. If you receive a plastic Warranty Registration Card, you may discard the Purchaser's Copy that you received from the distributor/dealer when you purchased the product. Ask your distributor/dealer if this plastic card program applies to you.
- For further information concerning the Warranty Registration Card and its relationship to Warranty Claim processing, refer to the International Warranty. Refer to Table of Contents.

IMPORTANT: Registration lists must be maintained by the factory and dealer in some countries by law. It is our desire to have ALL products registered at the factory should it ever be necessary to contact you. Make sure your dealer/distributor fills out the warranty registration card immediately and sends the factory copy to the Marine Power International Service Center for your area.

Warranty Policies

Recreational Use Diesel Sterndrive Limited Warranty

WHAT IS COVERED

Cummins MerCruiser Diesel warrants its new products to be free of defects in material and workmanship during the period described below.

DURATION OF COVERAGE

This Limited Warranty provides coverage for one (1) year from the date the product is first sold to a recreational use retail purchaser, or the date on which the product is first put into service, whichever occurs first. Commercial use of the product voids the warranty. Commercial use is defined as any work or employment related use of the product, or any use of the product which generates income, for any part of the warranty period, even if the product is only occasionally used for such purposes. The repair or replacement of parts, or the performance of service under this warranty, does not extend the life of this warranty beyond its original expiration date. Unexpired warranty coverage can be transferred from one recreational use customer to a subsequent recreational use customer upon proper re-registration of the product. Unexpired warranty coverage cannot be transferred either to or from a commercial use customer.

CONDITIONS THAT MUST BE MET IN ORDER TO OBTAIN WARRANTY COVERAGE

Warranty coverage is available only to retail customers that purchase from a Cummins MerCruiser Diesel authorized diesel engine manufacturer, Cummins MerCruiser Diesel Distributor or Cummins MerCruiser Diesel authorized Dealer in the country in which the sale occurred, and then only after the Cummins MerCruiser Diesel specified pre-delivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Inaccurate warranty registration information regarding recreational use, or subsequent change of use from recreational to commercial (unless properly re–registered) may void the warranty at the sole discretion of Cummins MerCruiser Diesel. Routine maintenance outlined in the Operation, Maintenance, and Warranty Manual must be timely performed in order to obtain warranty coverage. Cummins MerCruiser Diesel reserves the right to make any warranty coverage contingent upon proof of proper maintenance.

WHAT CUMMINS MERCRUISER DIESEL WILL DO

Cummins MerCruiser Diesel's sole and exclusive obligation under this warranty is limited to, at our option, repairing a defective part, replacing such part or parts with new or Mercury Marine certified re-manufactured parts, or refunding the purchase price of the Cummins MerCruiser Diesel product. Cummins MerCruiser Diesel reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

HOW TO OBTAIN WARRANTY COVERAGE

The customer must provide Cummins MerCruiser Diesel with a reasonable opportunity to repair, and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Cummins MerCruiser Diesel Distributor or Dealer authorized to service the product. If purchaser cannot deliver the product to such a dealer, written notice must be given to the nearest Cummins MerCruiser Diesel Distributor, who will then arrange for the inspection and any covered repair. Purchaser in that case shall pay for all related transportation charges and/or travel time. If the service provided is not covered by this warranty, purchaser shall pay for all related labor and material, and any other

expenses associated with that service. Purchaser shall not, unless requested by Cummins MerCruiser Diesel, ship the product or parts of the product directly to Cummins MerCruiser Diesel. The warranty registration card is the only valid registration identification and must be presented to the dealer at the time warranty service is requested in order to obtain coverage.

WHAT IS NOT COVERED

This limited warranty does not cover routine maintenance items, tune ups, adjustments, normal wear and tear, damage caused by abuse, abnormal use, use of a propeller or gear ratio that does not allow the engine to run in its recommended RPM range (see the Operation, Maintenance, and Warranty Manual), operation of the product in a manner inconsistent with the recommended operation/duty cycle section of the Operation, Maintenance, and Warranty Manual, neglect, accident, submersion, improper installation (proper installation specifications and techniques are set forth in the installation instructions for the product), improper service, use of an accessory or part which damages the Mercury product and was not manufactured or sold by us, jet pump impellers and liners, operation with fuels, oils or lubricants which are not suitable for use with the product (see the Operation, Maintenance, and Warranty Manual), alteration or removal of parts, water entering the engine through the fuel intake, air intake or exhaust system or damage to the product from insufficient cooling water caused by blockage of the cooling system by a foreign body, running the engine out of water, mounting the engine too high on the transom, or running the boat with the engine trimmed out too far. Use of the product for racing or other competitive activity, or operating with a racing type lower unit, at any point, even by a prior owner of the product, voids the warranty.

Expenses related to haul-out, launch, towing, storage, telephone, rental, inconvenience, slip fees, insurance coverage, loan payments, loss of time, loss of income, or any other type of incidental or consequential damages are not covered by this warranty. Also, expenses associated with the removal and/or replacement of boat partitions or material caused by boat design for access to the product are not covered by this warranty.

No individual or entity, including Cummins MerCruiser Diesel authorized Distributors / dealers or engine manufacturer, has been given authority by Cummins MerCruiser Diesel to make any affirmation, representation or warranty regarding the product, other than those contained in this limited warranty, and if made, shall not be enforceable against Cummins MerCruiser Diesel.

DISCLAIMERS AND LIMITATIONS

THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME STATES/COUNTRIES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE. AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY.

Warranty Coverage and Exclusion

Keep in mind that warranty covers repairs that are needed within the warranty period because of defects in material and workmanship. Installation errors, accidents, normal wear, and a variety of other causes that affect the product are not covered.

Warranty is limited to defects in material or workmanship, but only when the consumer sale is made in the country to which distribution is authorized by us.

Should you have any questions concerning warranty coverage contact your authorized dealer. They will be pleased to answer any questions that you may have.

Warranty Does Not Apply To The Following:

- Minor adjustments or checks, including checking controls, and checking lubrication made in connection with normal services.
- Damage caused by neglect, lack of maintenance, accident, abnormal operation, improper installation or service, or freezing temperatures.
- Haul-out, launch, towing charges; removal and/or replacement of boat partitions or material because of boat design for necessary access to the product; all related transportation charges and/or travel time, etc. Reasonable access must be provided to the product for warranty service. Customer must deliver product to an Authorized Dealer.
- Additional service work requested by customer other than that necessary to satisfy the warranty obligation.
- Labor performed by other than an Authorized Dealer may be covered only under following circumstances: When performed on emergency basis (providing there are no Authorized Dealers in area who can perform the work required or have no facilities to haul out, etc., and prior factory approval has been given to have the work performed at this facility).
- All incidental and/or consequential damages (storage charges, telephone or rental charges of any type, inconvenience or loss of time or income) are the owner’s responsibility.
- Use of other than Quicksilver replacement parts when making warranty repairs.
- Oils, lubricants or fluids changed as a matter of normal maintenance is customer’s responsibility unless loss or contamination of same is caused by product failure that would be eligible for warranty consideration.
- Participating in or preparing for racing or other competitive activity.
- Lower unit and/or propeller damage caused by striking a submerged object is considered a marine hazard.

- Failure of any parts caused by lack of cooling water, which results from starting power package out of water, foreign material blocking inlets or power package being mounted too high.
- Use of fuels and lubricants that are not suitable for use with or on the product. Refer to your Operation, Maintenance, And Warranty Manual.
- Our limited warranty does not apply to any damage to our products caused by the installation or use of parts and accessories that are not manufactured or sold by us. Failures that are not related to the use of those parts or accessories, are covered under warranty, if they otherwise meet the terms of the limited warranty for that product.

Transferable Warranty

The product warranty is transferable to a subsequent purchaser, but only for the remainder of the unused portion of the limited warranty. This will not apply to products used for commercial applications.

Direct Sale By Owner

- The second owner can be registered as the new owner and retain the unused portion of the limited warranty by sending the former owner's plastic Owner Warranty Registration Card and a copy of the bill of sale to show proof of ownership. In the United States and Canada, mail to:

  Mercury Marine
  Attn: Warranty Registration Department
  W6250 Pioneer Road
  P.O. Box 1939
  Fond du Lac, WI 54935-1939

- A new Owner Warranty Registration Card will be issued with the new owner's name and address. Registration records will be changed on the factory computer registration file.
- There is no charge for this service.

Outside the United States and Canada, please contact the distributor in your country, or the Marine Power International Service Center closest to you, for the transferable warranty procedure that would apply to you.

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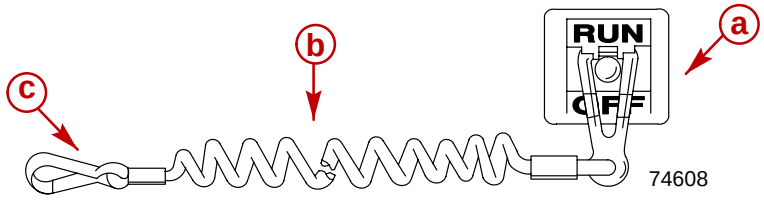
Features And Controls

Lanyard Stop Switch

The purpose of a lanyard stop switch is to turn off the engine when the operator moves outside the operator's position (as in accidental ejection from the operator's position).



a - Stop switch
b - Lanyard
c - Clips to the operator

Accidental ejections, such as falling overboard, are more likely to occur in:

- low sided sport boats
- bass boats
- high performance boats

Accidental ejections can also occur from:

- poor operating practices
- sitting on the seat or gunwale at planing speeds
- standing at planing speeds
- operating at planing speeds in shallow or obstacle infested waters
- releasing your grip on the steering wheel that is pulling in 1 direction
- consuming alcohol or drugs
- high speed boating maneuvers

Some remote control units are equipped with a lanyard stop switch, if your remote control is not equipped with a lanyard stop switch one can be installed on the dashboard or side adjacent to the operator's position. The lanyard is a cord usually1.2 - 1.5 m (4 - 5 ft) long when stretched out with an element on 1 end made to be inserted into the switch and a snap on the other end for attaching to the operator. The lanyard is coiled to make it as short as possible to minimize the likelihood of entanglement with nearby objects. It stretches to minimize the likelihood of accidental activation should the operator choose to move around in an area close to the normal operator's position. To shorten the lanyard, wrap it around the operator's wrist or leg, or tie a knot in the lanyard.

Activation of the lanyard stop switch will stop the engine immediately, but the boat will continue to coast for some distance depending upon the velocity and degree of any turn at shut down. However, the boat will not complete a full circle. While the boat is coasting, it can cause injury to anyone in the boat's path as seriously as the boat would when under power.

We strongly recommend that other occupants be instructed on proper starting and operating procedures should they be required to operate the engine in an emergency (e.g. if the operator is accidentally ejected).

⚠ WARNING

Avoid contact with the boat hull and propeller from accidental ejection. Personal injury or death could occur. Always properly connect both ends of the lanyard stop switch.

Accidental or unintended activation of the switch during normal operation is also a possibility. This could cause any, or all, of the following potentially hazardous situations:

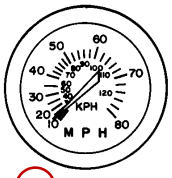
- Occupants could be thrown forward due to unexpected loss of forward motion, a particular concern for passengers in the front of the boat who could be ejected over the bow and possibly struck by the gear case or propeller.
- Loss of power and directional control in heavy seas, strong current or high winds.
- Loss of control when docking.

⚠ WARNING

Avoid abrupt deceleration of the boat from lanyard stop switch activation. Boat damage and personal injury or death could occur. NEVER leave the operator's station with the engine operating and in gear.

Instrumentation

The following is a brief explanation of the instrumentation typically found on some boats. The owner/operator should be familiar with all instruments and their functions. Because of the large variety of instrumentation and manufacturers, you should have your boat dealer explain the particular gauges and normal readings for your boat.



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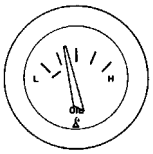
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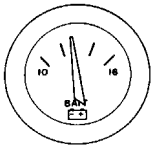
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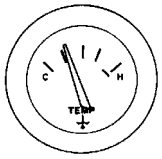
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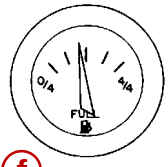

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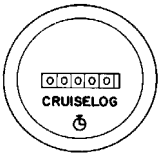

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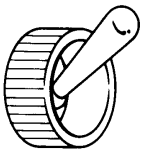
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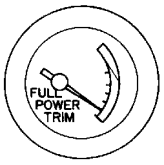

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Typical

- **a -** Speedometer
- **b -** Tachometer
- **c -** Oil pressure gauge
- **d -** Battery meter
- **e -** Water temperature gauge
- **f -** Fuel gauge
- **g -** Hour meter
- **h -** Bilge blower switch
- **i -** Ignition switch
- **j -** Power trim gauge

Speedometer: Indicates boat speed.

Tachometer: Indicates engine rpm.

Oil Pressure Gauge: Indicates engine oil pressure.

Battery Meter: Indicates battery voltage.

Water Temperature Gauge: Indicates engine operating temperature.

Fuel Gauge: Indicates quantity of fuel in tank.

Hour Meter: Records engine operating time.

Bilge Blower Switch: Operates bilge blower.

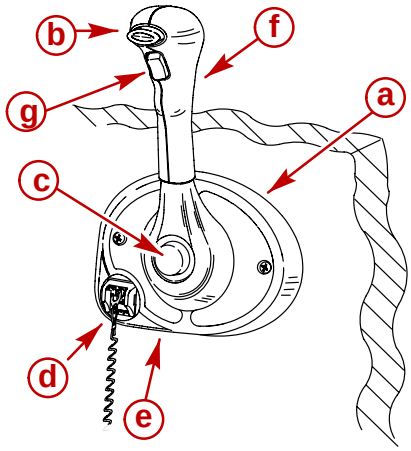
Ignition Switch: Allows operator to start and stop engine.

Power Trim Gauge: Indicates sterndrive unit angle (trim up/out and down/in). Sterndrive Models only.

Remote Controls

Your boat may be equipped with Mercury Precision Parts or Quicksilver remote controls. All controls may not have all features shown. Consult your dealer or distributor for a description and/or demonstration of your remote control.

PANEL MOUNTED



a - Neutral Safety Switch circuit
b - Neutral lock button
c - Throttle only button
d - Lanyard stop switch
e - Control handle throttle friction screw
f - Control handle
g - Trim / tilt button

Neutral Safety Switch Circuit - Special electrical circuitry that allows starter engagement only when the remote control handle is in the NEUTRAL position.

Neutral Lock Button - Prevents accidental shift and throttle engagement. Neutral lock button must be pushed IN to move the control handle out of NEUTRAL.

Throttle Only Button - Allows engine throttle advancement without shifting the engine. This is done by disengaging the shift mechanism from the control handle. The throttle only button can be depressed only when the remote control handle is in the NEUTRAL position, and should only be used to assist in starting the engine.

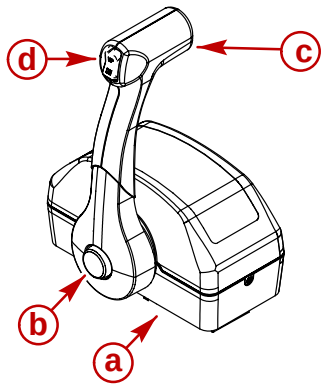
Lanyard Stop Switch - Turns the ignition OFF whenever the operator (when attached to the lanyard) moves far enough away from the operator's position to activate the switch. Refer to Lanyard Stop Switch for information on the use of this switch.

Control Handle Throttle Friction Screw - This screw (located behind the bezel cover) can be adjusted to increase or decrease the tension on the control handle. This will help prevent slipping of the remote control handle. Turn screw clockwise to increase tension and counterclockwise to decrease tension. Adjust to tension desired.

Control Handle - Operation of the shift and throttle are controlled by the movement of the control handle. Push the control handle forward from NEUTRAL with a quick firm motion to the first detent for FORWARD gear. Continue pushing forward to increase speed. Pull the control handle back from NEUTRAL with a quick firm motion to the first detent for REVERSE gear and continue pushing back to increase speed.

Trim/Tilt Button - Refer to Power Trim.

CONSOLE MOUNTED



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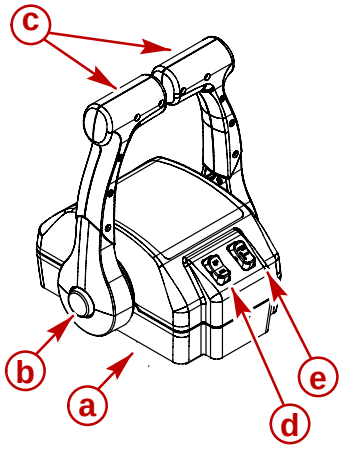


79690

a - Neutral Safety Switch circuit
b - Throttle only button
c - Control handles
d - Power Trim switch
e - Trailer switch

Neutral Safety Switch Circuit - Special electrical circuitry that allows starter engagement only when the remote control handle is in the NEUTRAL position.

Throttle Only Button - Allows engine throttle advancement without shifting the engine. This is done by disengaging the shift mechanism from the control handle. The throttle only button can be depressed only when the remote control handle is in the NEUTRAL position, and should only be used to assist in starting the engine.

Control Handle Tension Adjustment Screw - This screw can be adjusted to increase or decrease the tension on the control handle (cover must be removed to adjust). This will help prevent slipping of the remote control handle. Turn screw clockwise to increase tension and counterclockwise to decrease tension. Adjust to tension desired.

Control Handles - Operation of the the shift and throttle are controlled by the movement of the control handle. Push the control handle forward from NEUTRAL with a quick firm motion to the first detent for FORWARD gear and continue pushing forward to increase speed. Pull the control handle back from NEUTRAL with a quick firm motion to the first detent for REVERSE gear and continue pushing back to increase speed.

Power Trim Switch - See Power Trim section for detailed power trim operating procedures.

Trailer Switch - Used to raise drive unit for trailering, launching, beaching or shallow water operation. On the single remote control handle units, the trailering mode begins with the second click or when the Power Trim/ Trailer Switch is pressed all the way UP. See Power Trim for detailed trailer switch operation.

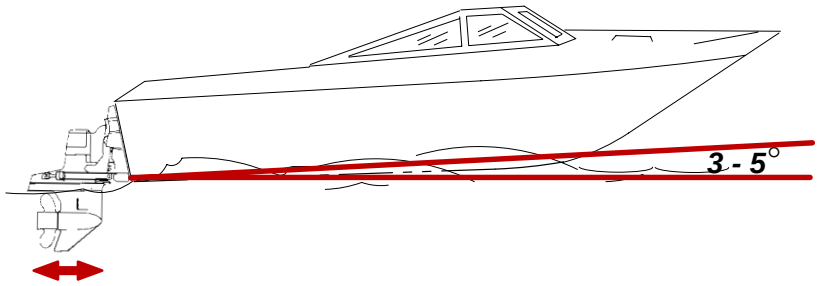
Power Trim

Power Trim allows the operator to adjust the sterndrive angle while underway, to provide the ideal boat angle for varying load and water conditions. Also, the Power Trim system Trailering feature allows the operator to raise and lower the sterndrive unit for trailering, beaching, launching and low speed (below 1200 rpm engine speed), shallow water operation.

⚠ CAUTION

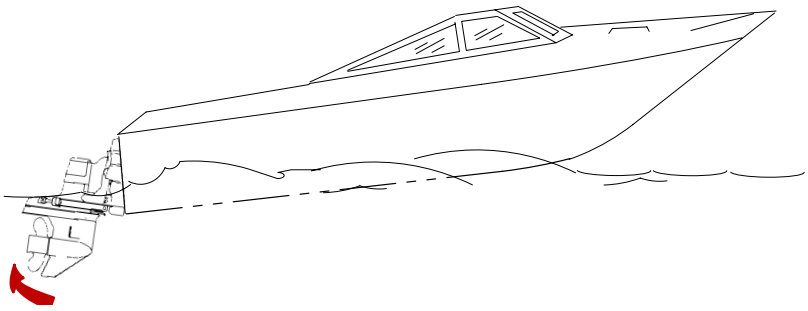
Never trim the sterndrive unit UP/OUT using TRAILER switch while boat is underway at engine speeds above 1200 rpm. Use extreme caution when operating with sterndrive unit raised. Severe damage to the sterndrive unit may result if unit is raised beyond the gimbal ring support flanges at engine speeds above 1200 rpm.

For best performance trim the sterndrive unit so that the boat bottom is at a 3-5 degree angle to the water.



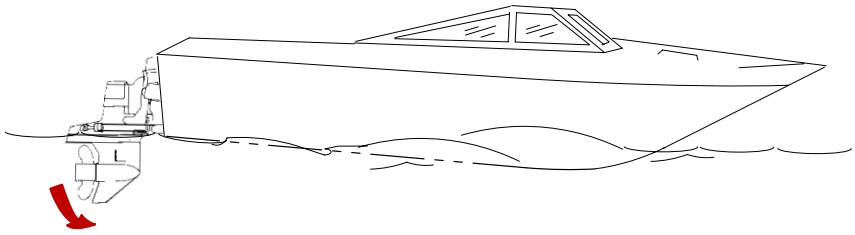
Trimming sterndrive unit UP/OUT can:

- Generally increase top speed
- Increase clearance over submerged objects or a shallow bottom
- Cause boat to accelerate and plane off slower
- In excess, cause boat porpoising (bouncing) or propeller ventilation
- Cause engine overheating if trimmed UP/OUT to a point where any cooling water intake holes are above the water line



Trimming sterndrive unit DOWN/IN can:

- Help the boat accelerate and plane off quicker
- Generally improve the ride in choppy water
- In most cases, reduce boat speed
- If in excess, lower the bow of some boats to a point at which they begin to plow with their bow in the water while on plane. This can result in an unexpected turn in either direction called bow steering or over steering if any turn is attempted or if a significant wave is encountered.



SINGLE ENGINE TRIM/TRAILER

Single engine applications will have a button that can be pressed to trim the sterndrive unit up or down.

To raise the sterndrive unit for trailering, beaching, launching and low speed (below 1200 rpm), shallow water operation push the trim button to raise the sterndrive unit to the full UP/OUT position.

Some controls also have a trailer button that trims the sterndrive to a position suitable for trailer purposes only.

DUAL ENGINE TRIM/TRAILER

⚠ CAUTION

Avoid twisting or binding dual engine tie bars. Damage to the tie bar and sterndrives could occur. ALWAYS raise or lower the sterndrive units evenly.

Dual engine applications may have a single integral button to operate both sterndrive units simultaneously or may have separate buttons for each sterndrive unit.

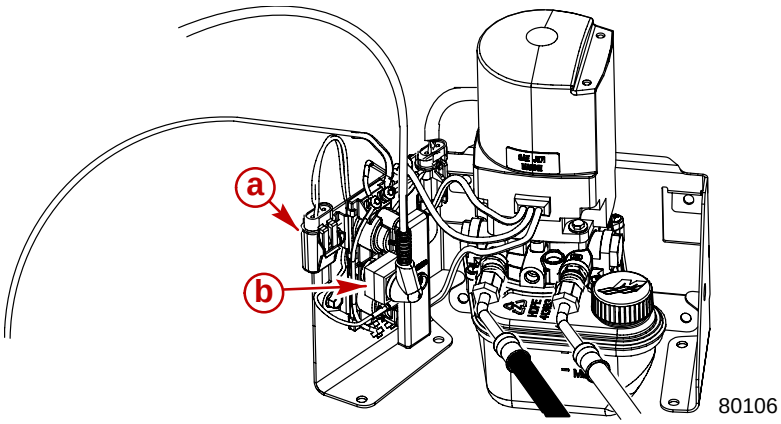
Some controls also have a trailer button that trims the drives to a position suitable for trailer purposes only.

Electrical System Overload Protection

If an electrical overload on the sterndrive electrical system occurs, a fuse will burn out (blow). The cause must be found and corrected before replacing the fuse.

NOTE: *In an emergency, when the engine must be operated and the cause for the electrical overload, or excessive current draw, cannot be located and corrected, turn OFF or disconnect all accessories connected to the engine and instrumentation wiring. Replace the fuse. If the fuse burns out, the electrical overload has not been eliminated. Further checks must be made on the electrical system. Contact your authorized Cummins MerCruiser Diesel dealer / distributor.*

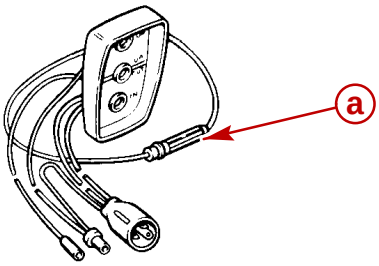
1. The Power Trim System is protected from overload by a 110 amp fuse and a 20 amp in-line fuse on the power trim pump.



80106

a - 20 amp. holder
b - 110 amp. fuse

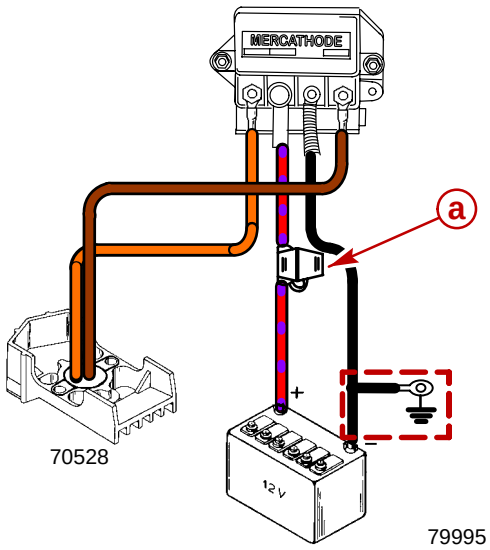
2. The Quicksilver Three-Button Power Trim Control Panel is protected from overload by a 20 amp in-line fuse.



70527

a - 20 amp. fuse holder

3. The Quicksilver MerCathode System has a 20 amp in-line fuse in the wire which connects to the positive (+) terminal on the controller. If the fuse is burned out (blown), the system will not operate resulting in a loss of corrosion protection.



Typical

a - 20 amp. fuse holder

SECTION 3 - ON THE WATER

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3

Safe Boating Suggestions

In order to safely enjoy the waterways, familiarize yourself with local and all other governmental boating regulations and restrictions and also consider the following suggestions.

- **Know and obey all nautical rules and laws of the waterways.**

Cummins MerCruiser Diesel strongly recommends that all powerboat operators complete a boating safety course. Courses are offered in the U.S.A. by: The U.S. Coast Guard Auxiliary, The Power Squadron, The Red Cross and your state or provincial boating law enforcement agency. Inquiries may be made to the Boating Hotline at 1-800-368-5647 or the Boat U.S. Foundation at 1-800-336-BOAT.

You should also review the NMMA Sources of Waterway Information booklet. It lists regional sources of safety, cruising and local navigation and is available at no charge by writing to:

Sources of Waterway Information
National Marine Manufacturers Association
410 N. Michigan Avenue
Chicago, IL 60611 U.S.A.

- **Perform safety checks and required maintenance.** Follow a regular schedule and ensure that all repairs are properly made.
- **Check safety equipment on board.** Here are some suggestions of the types of safety equipment to carry when boating:

Approved fire extinguishers	Paddle or oar
Signal devices: flashlight, rockets or flares, flag and whistle or horn	Spare propeller, thrust hubs, and an appropriate wrench
Tools necessary for minor repairs	First aid kit and instructions
Anchor and extra anchor line	Water-proof storage containers
Manual bilge pump and extra drain plugs	Spare operating equipment, batteries, bulbs and fuses
Drinking water	Compass and map or chart of the area
Transistor radio	

- **Watch for signs of weather change and avoid foul weather and rough-sea boating.**
- **Tell someone where you are going and when you expect to return.**
- **Passenger boarding.** Stop the engine whenever passengers are boarding, unloading or are near the back (stern) of the boat. Shifting the drive unit into neutral is not sufficient.
- **Use personal flotation devices.** Federal Law requires that there be a U. S. Coast Guard approved, wearable-type life jacket (personal flotation device), correctly sized and readily accessible for every person on board, plus a throwable cushion or ring. We strongly advise that everyone wear a life jacket at all times while in the boat.
- **Prepare other boat operators.** Instruct at least 1 person on board in the basics of starting and operating the engine and boat handling in case the driver becomes disabled or falls overboard.
- **Do not overload your boat.** Most boats are rated and certified for maximum load (weight) capacities (refer to your boat capacity plate). Know your boat's operating and loading limitations. Know if your boat will float if full of water. When in doubt, contact your authorized Cummins MerCruiser Diesel dealer / distributor or the boat manufacturer.
- **Ensure that everyone in the boat is properly seated.** Do NOT allow anyone to sit or ride on any part of the boat that was not intended for such use. This includes the backs of seats, gunwales, transom, bow, decks, raised fishing seats and any rotating fishing seat; anywhere that sudden unexpected acceleration, sudden stopping, unexpected loss of boat control or sudden boat movement could cause a person to be thrown overboard or into the boat. Ensure that all passengers have a proper seat and are in it before any boat movement.
- **Never be under the influence of alcohol or drugs while boating (it is the law).** They impair your judgment and greatly reduce your ability to react quickly.

- **Know your boating area and avoid hazardous locations.**
- **Be alert.** The operator of the boat is responsible by law to “maintain a proper lookout by sight and hearing.” The operator must have an unobstructed view particularly to the front. No passengers, load or fishing seats should block the operators view when operating the boat above idle or planing transition speed. Watch out for others, the water and your wake.
- **Never drive your boat directly behind a water skier in case the skier falls.** As an example, your boat traveling at 40 km/h (25 MPH) will overtake a fallen skier who was 61 m (200 ft) in front of you in 5 seconds.
- **Watch fallen skiers.** When using your boat for water skiing or similar activities, always keep a fallen or down skier on the operator’s side of the boat while returning to attend to the skier. The operator should always have the down skier in sight and never back up to the skier or anyone in the water.
- **Report accidents.** Boat operators are required by law to file a Boating Accident Report with their state boating law enforcement agency when their boat is involved in certain boating accidents. A boating accident must be reported if (1) there is loss of life or probable loss of life, (2) there is personal injury requiring medical treatment beyond first aid, (3) there is damage to boats or other property where the damage value exceeds $500.00 or (4) there is complete loss of the boat. Seek further assistance from local law enforcement.

Be Alert To Carbon Monoxide Poisoning

Carbon monoxide is present in the exhaust fumes of all internal combustion engines including the outboards, sterndrives and inboard engines that propel boats, as well as the generators that power various boat accessories. Carbon monoxide is a deadly gas that is odorless, colorless and tasteless.

Early symptoms of carbon monoxide poisoning, which should not be confused with seasickness or intoxication, include headache, dizziness, drowsiness and nausea.

⚠ WARNING

Avoid prolonged exposure to carbon monoxide. Carbon monoxide poisoning can lead to unconsciousness, brain damage or death. Ensure that the boat, while at rest or underway, is well ventilated.

GOOD VENTILATION

Ventilate the passenger area, open the side curtains or forward hatches to remove fumes.

1. Example of desired air flow through the boat.

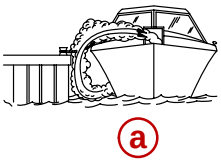
Courtesy of ABYC

POOR VENTILATION

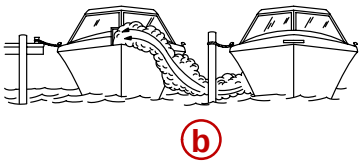
Under certain conditions, permanently enclosed or canvas enclosed cabins or cockpits with insufficient ventilation may draw in carbon monoxide. Install 1 or more carbon monoxide detectors in your boat.

Although the occurrence is rare, on a very calm day, swimmers and passengers in an open area of a stationary boat that contains or is near an operating engine may be exposed to a hazardous level of carbon monoxide.

1. Examples of poor ventilation while a boat is stationary:



a

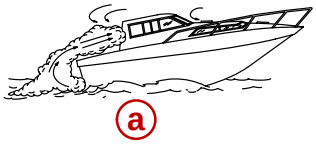


b

Courtesy of ABYC

a - Operating the engine when the boat is moored in a confined space
b - Mooring close to another boat with its engine operating

2. Examples of poor ventilation while a boat is moving:



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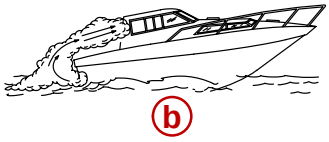


b

Courtesy of ABYC

a - Operating the boat with the trim angle of the bow too high
b - Operating the boat with no forward hatches open (station wagon effect)

Basic Boat Operation

Launching And Boat Operation Care

⚠ CAUTION

To avoid possible ingestion of water that can damage engine components:

- **Do NOT turn the ignition key off when the engine is above idle speed.**
- **When launching your boat from a steep ramp, enter the water slowly.**
- **Do NOT use the lanyard stop switch to shut off the engine above idle speed.**
- **When coming off plane, if a large following wave may roll over the boat's transom, apply a short, light burst of throttle to minimize the wave action against the stern of the boat.**
- **Do NOT come off plane quickly, shift into reverse and shut off engine.**

IMPORTANT: Install bilge drain plug prior to launching boat.

Starting Engine After Stopped While In Gear

IMPORTANT: Avoid stopping the engine if the sterndrive unit is in gear. If the engine does stop, refer to the following procedure:

1. Push and pull repeatedly on the remote control handle until handle returns to the NEUTRAL/IDLE position. This may take several tries if the power package was operating above idle rpm when the engine stopped.
2. After the handle returns to the NEUTRAL/IDLE position, resume normal starting procedures.

Trailering The Boat

Your boat can be trailered with the sterndrive unit in the UP or DOWN position. Adequate clearance is required between the road and sterndrive when transporting.

If adequate road clearance is a problem, place the sterndrive unit in full trailer position and support it with an optional trailer kit which is available from your authorized Cummins MerCruiser Diesel dealer / distributor.

Freezing Temperature Operation

IMPORTANT: If the boat is operated during periods of freezing temperature, precautions must be taken to prevent freeze damage to the power package. Damage caused by freezing IS NOT covered by Cummins MerCruiser Diesel Limited Warranty.

Drain Plug and Bilge Pump

The engine compartment in your boat is a natural place for water to collect. For this reason, boats are normally equipped with a drain plug and/or a bilge pump. It is very important to check these items on a regular basis to ensure that the water level does not come into contact with your power package. Components on your engine will be damaged if submerged. Damage caused by submersion is not covered by the Cummins MerCruiser Diesel Limited Warranty.

Protecting People In The Water

While You Are Cruising

It is very difficult for a person standing or floating in the water to take quick action to avoid a boat heading in his/her direction even at slow speed.

Always slow down and exercise extreme caution any time you are boating in an area where there might be people in the water.

Whenever a boat is moving (coasting) in NEUTRAL/IDLE, there is sufficient force by the water on the propeller to cause the propeller to rotate. This neutral propeller rotation can cause serious injury.

While Boat Is Stationary

⚠ WARNING

Stop your engine immediately whenever anyone in the water is near your boat. Serious injury to the person in the water is likely if contacted by a rotating propeller, a moving boat, a gear case or any solid device rigidly attached to a moving boat or gear case.

Shift into the NEUTRAL/IDLE position and shut off the engine before allowing people to swim or be in the water near your boat.

High-Speed And High-Performance Boat Operation

If your boat is considered a high-speed or high-performance boat with which you are unfamiliar, we recommend that you never operate it at its high speed capability without first requesting an initial orientation and demonstration ride with your dealer or an operator experienced with your boat. For additional information, refer to ***Hi-Performance Boat Operation*** booklet (90-849250-R2) from your authorized Cummins MerCruiser Diesel dealer / distributor.

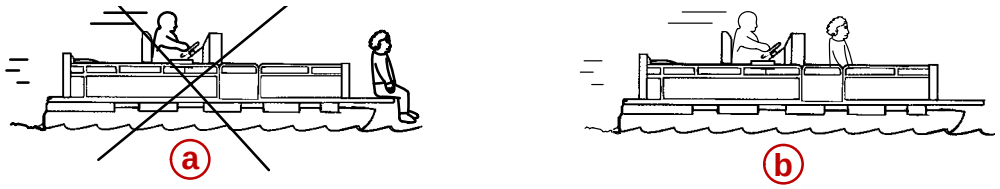
Passenger Safety Message - Pontoon And Deck Boats

⚠ WARNING

Avoid serious injury or death from falling over the front end of a pontoon or deck boat and coming in contact with the boat hull or propeller. Stay back from the front end of the deck and remain seated while the boat is in motion.

Whenever the boat is in motion, observe the location of all the passengers. Do NOT allow any passengers to stand or use seats other than those designated for traveling faster than idle speed. A sudden reduction in boat speed, such as the result of plunging into a large wave or wake, a sudden throttle reduction or a sharp change of boat direction, could throw them over the front of boat. Falling over the front of the boat between the 2 pontoons will position them to come into contact with the drive unit.

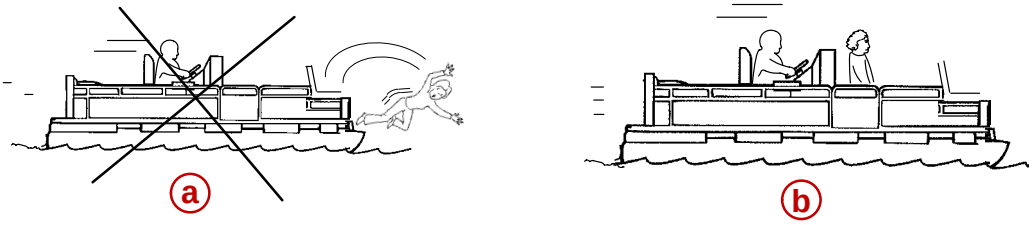
1. **Boats having an open front deck:**



   a. No one should ever be on the deck in front of the fence while the boat is in motion. Keep all passengers behind the front fence or enclosure.

   b. Persons on the front deck could easily be thrown overboard or persons dangling their feet over the front edge could get their legs caught by a wave and pulled into the water.

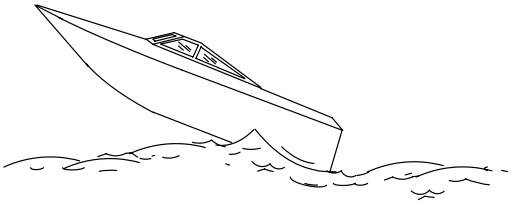
2. **Boats with front-mounted, raised pedestal fishing seats:**



   a. These elevated fishing seats are not intended for use when the boat is traveling faster than idle or trolling speed. Sit only in seats designated for traveling at faster speeds.

   b. Any unexpected sudden reduction in boat speed could result in the elevated passenger falling over the front of the boat.

Wave And Wake Jumping



⚠ WARNING

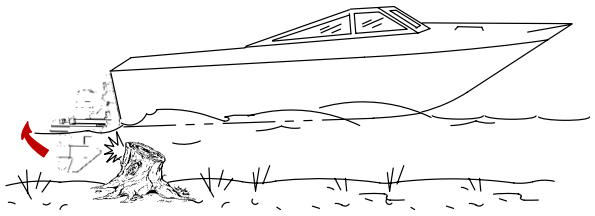
Avoid serious injury or death from being thrown within or out of a boat when it lands after jumping a wave or wake. Avoid wave or wake jumping whenever possible. Instruct all occupants that if a wake or wave jump occurs, get low and hang on to a boat hand hold.

Operating recreational boats over waves and wakes is a natural part of boating. However, when this activity is done with enough speed to force the boat hull partially or completely out of the water, certain hazards arise, particularly when the boat re-enters the water.

The primary concern is the boat changing direction while in the midst of the jump. In such cases the landing may cause the boat to violently veer in a new direction. Such a sharp change in direction or turn can cause occupants to be thrown out of their seats or out of the boat.

There is another less common hazardous result from allowing your boat to launch off of a wave or wake. If the bow of your boat pitches down far enough while airborne, upon water contact it may penetrate under the water surface and submarine for an instant. This will bring the boat nearly to a stop in an instant and can send the occupants flying forward. The boat may also veer sharply to one side.

Impact With Underwater Hazards



Reduce speed and proceed with caution whenever you're driving a boat in shallow water or in areas where the waters are suspected of having underwater obstacles that could be struck by the underwater drive components, rudder or the boat bottom.

IMPORTANT: The most important thing you can do to help reduce injury or impact damage from striking a floating or underwater object is control the boat speed. Under these conditions, boat speed should be kept to a maximum speed of 15 to 25 MPH (24 to 40 km/h).

Striking a floating/underwater object may result in an infinite number of situations. Some of these situations could result in the following:

- The boat could move suddenly in a new direction. Such a sharp change in direction or turn can cause occupants to be thrown out of their seats or out of the boat.
- A rapid reduction in speed. This will cause occupants to be thrown forward, even out of the boat.
- Impact damage to the underwater drive components, rudder and/or boat.

Keep in mind, one of the most important things you can do to help reduce injury or impact damage in these situations is control the boat speed. Boat speed should be kept to a minimum planing speed when driving in waters known to have underwater obstacles.

After striking a submerged object, stop the engine as soon as possible and inspect the drive system for any broken or loose parts. If damage is present or suspected, the power package should be taken to an authorized Cummins MerCruiser Diesel dealer / distributor for a thorough inspection and necessary repair.

The boat should be checked for hull fractures, transom fractures and water leaks.

Operating with damaged underwater drive components, rudder or boat bottom could cause additional damage to other parts of the power package, or could affect control of the boat. If continued operation is necessary, do so at greatly reduced speeds.

⚠ WARNING

Avoid serious injury or death from loss of boat control. Continued boating with major impact damage can result in sudden component failure with or without subsequent impacts. Have the power package thoroughly inspected and any necessary repairs made.

Drive Unit Impact Protection

The power trim hydraulic system is designed to provide impact protection for the sterndrive unit. If a submerged object is struck while the boat is moving forward, the hydraulic system will cushion the kickup of the sterndrive unit as it clears the object, reducing damage to the unit. After the sterndrive unit has cleared the object, the hydraulic system allows the sterndrive unit to return to its original operating position, preventing loss of steering control and engine overspeed.

Use extreme caution when operating in shallow water or where underwater objects are known to be present. No impact protection is provided in REVERSE, use extreme care to prevent striking submerged objects while operating in REVERSE.

IMPORTANT: Impact protection system cannot be designed to ensure total protection from impact damage under all conditions.

Conditions Affecting Operation

Weight Distribution (Passengers And Gear) Inside The Boat

Shifting weight to rear (stern):

- Generally increases speed and engine rpm
- Causes bow to bounce in choppy water
- Increases danger of following wave splashing into the boat when coming off plane
- At extremes, can cause the boat to porpoise

Shifting weight to front (bow):

- Improves ease of planing
- Improves rough water ride
- At extremes, can cause the boat to veer back and forth (bow steer)

Bottom Of Boat

To maintain maximum speed, the boat bottom should be:

- Clean, free of barnacles and marine growth
- Free of distortion; nearly flat where it contacts the water
- Straight and smooth, fore and aft

Marine vegetation may accumulate when the boat is docked. This growth must be removed before operation; it may clog the water inlets and cause the engine to overheat.

Cavitation

Cavitation occurs when water flow cannot follow the contour of a fast-moving underwater object, such as a gear housing or a propeller. Cavitation permits the propeller to speed up, but the boat speed to reduce. Cavitation can seriously erode the surface of the gear housing or the propeller. Common causes of cavitation are:

- Weeds or other debris snagged on the propeller
- Bent propeller blade
- Raised burrs or sharp edges on the propeller

Ventilation

Ventilation is caused by surface air or exhaust gases that are introduced around the propeller resulting in propeller speedup and a reduction in boat speed. Excessive ventilation is annoying and usually caused by:

- Drive unit trimmed out too far
- A missing propeller diffuser ring
- A damaged propeller or gear housing, which allows exhaust gases to escape between propeller and gear housing
- Drive unit installed too high on transom

Elevation And Climate

Elevation and climate changes will affect the performance of your power package. Loss of performance can be caused by:

- Higher elevations
- Higher temperatures
- Low barometric pressures
- High humidity

For you to have optimum engine performance under changing weather conditions, it is essential that the engine be propped to allow the engine to operate at or near the top end of the specified maximum rpm range with a normal boat load during your normal boating weather conditions.

In most cases, performance can be regained by changing to a lower pitch propeller.

Propeller Selection

IMPORTANT: The installed propeller must allow engine to operate at the Engine Rated revolutions per minute (rpm). Use an accurate service tachometer to verify engine operating rpm.

It is the responsibility of the boat manufacturer and/or the selling dealer to equip the power package with the correct propellers. Refer to the ***Diesel Parts And Accessories Guide*** (CMD-4081891 / 90-892645003) and read - *Everything You Need To Know About Propellers.* Refer to the engine manufacturer or manufacturer's operation manual for the specified Engine Rated rpm.

Select a propeller that will allow the engine power package to operate at the Engine Rated rpm with a full load on board. High rpm, caused by an excessive trim angle, should not be used in determining correct propeller selection.

If full throttle operation is below the Engine Rated rpm, the propeller must be changed to prevent loss of performance and possible engine damage. On the other hand, operating an engine above the Engine Rated rpm will cause higher than normal wear and/or damage.

After initial propeller selection, the following common problems may require that the propeller be changed to a lower pitch:

- Warmer weather and greater humidity cause an rpm loss
- Operating in a higher elevation causes an rpm loss
- Operating with increased load (additional passengers, pulling skiers, etc.)

For better acceleration, such as is needed for water skiing, use the next lower pitch propeller. However, do not operate at full throttle when using the lower pitch propeller but not pulling skiers.

Because of the many variables of boat design, only testing will determine the best propeller for a particular application. Available propellers are listed in the ***Diesel Parts And Accessories Guide*** (CMD-4081891 / 90-892645003).

See **Boat In The Water Tests, Wide Open Throttle Test** in this power package Installation Manual.

Getting Started

Sterndrive Unit 10-Hour Break-In Period

It is especially important that the following procedure be used on new sterndrive units. This break-in procedure allows the proper seating of drive unit gears and related components, which greatly reduces the likelihood of problems.

1. Avoid full throttle starts.
2. Do not operate at any one constant speed for extended periods of time.
3. Do not exceed 75% of full throttle during the first 5 hours. During the next 5 hours, operate at intermittent full throttle.
4. Drive unit should be shifted into forward gear a minimum of 10 times during break-in, with run-in time at moderate rpm after each shift.

End of First Season Checkup

At the end of the first season of operation, contact an authorized Cummins MerCruiser Diesel dealer / distributor to discuss and/or perform scheduled maintenance items. If you are in an area where the product is operated continuously, year-round, you should contact your dealer at the end of the first 100 hours of operation or once yearly, whichever occurs first.

SECTION 4 - SPECIFICATIONS

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Specifications

Fluid Specifications

IMPORTANT: All capacities are approximate fluid measures.

Sterndrives

NOTE: *Oil capacity includes gear lube monitor.*

Model	Capacity ml (oz)	Fluid Type	Part Number
Bravo One	2736 (92-1/2)	High Performance Gear Lube	92-802854A1
Bravo Two	3209 (108-1/2)		
Bravo Three	2972 (100-1/2)		

SECTION 5 - MAINTENANCE

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5

Owner/Operator Responsibilities

It is the operator's responsibility to perform all safety checks, to ensure that all lubrication and maintenance instructions are complied with for safe operation and to return the unit to an authorized Cummins MerCruiser Diesel dealer / distributor for a periodic checkup.

Normal maintenance service and replacement parts are the responsibility of the owner/operator and as such, are not considered defects in workmanship or material within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

Proper maintenance and care of your power package will ensure optimum performance and dependability and will keep your overall operating expenses at a minimum. See your authorized Cummins MerCruiser Diesel dealer / distributor for service aids.

Dealer / Distributor Responsibilities

In general, a dealer's responsibilities to the customer include predelivery inspection and preparation such as:

- Ensure that the boat is properly equipped.
- Prior to delivery, make certain that the Cummins MerCruiser Diesel power package and other equipment are in proper operating condition.
- Make all necessary adjustments for maximum efficiency.
- Familiarize the customer with the on-board equipment.
- Explain and demonstrate the operation of the power package and boat.
- Provide you with a copy of a Predelivery Inspection Checklist
- Your selling dealer should fill out the Warranty Registration Card completely and mail it to the factory immediately upon sale of the new product.

Maintenance

⚠ WARNING

Avoid injury or death and power package damage from an electrical shock, fire or explosion. Always disconnect both battery cables from the battery before servicing the power package.

IMPORTANT: Refer to MAINTENANCE CHART for complete listing of all scheduled maintenance to be performed. Some listings can be done by owner/operator, while others should be performed by an authorized Cummins MerCruiser Diesel dealer / distributor. Before attempting maintenance or repair procedures not covered in this manual, it is recommended that the appropriate Cummins MerCruiser Diesel Service Manual or Mercury MerCruiser Service Manual be purchased and read thoroughly.

Do-It-Yourself Maintenance Suggestions

If you are one of those persons who likes to do-it-yourself, here are some suggestions for you.

- Present-day marine equipment, such as your Cummins MerCruiser Diesel power package, are highly technical pieces of machinery. Special systems provide greater fuel economies, but also are more complex for the untrained mechanic.
- Do not attempt any repairs which are not covered in this manual unless you are aware of the precautions (“Cautions” and “Warnings”) and procedures required. Your safety is of our concern.
- If you attempt to service the product yourself, we suggest you order the service manual for that model. The service manual outlines the correct procedures to follow. It is written for the trained mechanic, so there may be procedures you don’t understand. Do not attempt repairs if you do not understand the procedures.
- There are special tools and equipment that are required to perform some repairs. Do not attempt these repairs unless you have these special tools and/or equipment. You can cause damage to the product in excess of the cost a local dealer / distributor would charge you.
- Also, if you partially disassemble an engine or drive assembly and are unable to repair it, the local dealer / distributor’s mechanic must reassemble the components and test to determine the problem. This will cost you more than taking it to the local dealer / distributor immediately upon having a problem. It may be a very simple adjustment to correct the problem.
- Do not telephone the dealer, local distributor, service office or the factory to attempt for them to diagnose a problem or request the repair procedure. It is difficult for them to diagnose a problem over the telephone.
- Your local dealer / distributor of Cummins MerCruiser Diesel products is there to service your power package. They have qualified factory-trained mechanics.

It is recommended you have the local dealer / distributor of Cummins MerCruiser Diesel products do periodic maintenance checks on your power package. Have them winterize it in the fall and service it before the boating season. This will reduce the possibility of any problems occurring during your boating season when you want trouble-free boating pleasure.

Inspection

Inspect your power package often, and at regular intervals, to help maintain its top operating performance and correct potential problems before they occur. The entire power package should be checked carefully, including all accessible engine parts.

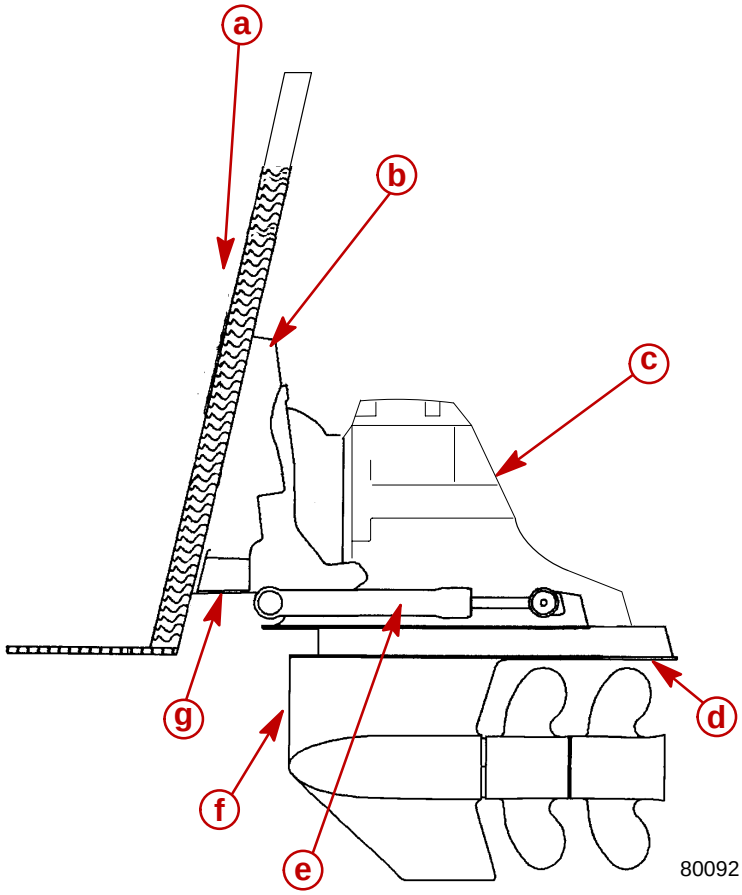
Check for loose, damaged or missing parts, hoses and clamps; tighten or replace as necessary.

Check electrical connections and leads for damage.

Remove and inspect the propeller. If badly nicked, bent or cracked, contact your authorized Cummins MerCruiser Diesel dealer / distributor.

Repair nicks and corrosion damage on power package exterior finish. Contact your authorized Cummins MerCruiser Diesel dealer / distributor.

Port (Left) Side View



a - Steering system location
b - Transom assembly
c - Sterndrive unit
d - Antiventilation plate
e - Power trim cylinder
f - Speedometer pitot tube
g - MerCathode electrode

Sterndrive Maintenance Chart

Routine Maintenance	Each day start	Weekly	Every Two Months
Check the sterndrive unit oil level, the trim pump oil level and the power steering pump fluid level.	●		
Check the water inlets for debris or marine growth. Check the seawater strainer and clean.		●	
Inspect the drive unit anodes and replace if 50 percent eroded.		●	
Lubricate the propeller shaft and retorque the nut. [1]			●

Scheduled Maintenance	Every 100 hours or Annually ◆
Touch-up paint the power package and spray with corrosion guard.	●
Change the drive unit oil.	●
Retorque the gimbal ring to steering shaft connection.	●
Inspect the bellows and the clamps. Check the engine alignment.	●
Lubricate the gimbal bearing and the engine coupler. [2]	●
Drive shaft extension models: Lubricate the drive shaft U-joints, and the tailstock input and output bearings.	●
Check the continuity circuit for loose or damaged connections. Test the MerCathode® unit output on Bravo models.	●
Check the steering system and the remote control for loose, missing or damaged parts. Lubricate the cables and the linkages.	●
Retorque the engine mounts.	●

◆ Whichever Occurs First

[1] *If operating in only freshwater, this maintenance may be extended to every four months.*

[2] *Lubricate engine coupler every 50 hours if operated at idle for prolonged periods of time.*

Maintenance Record

Date	Hour Meter Reading	Serviced By	Maintenance Performed

Sterndrive Unit Oil

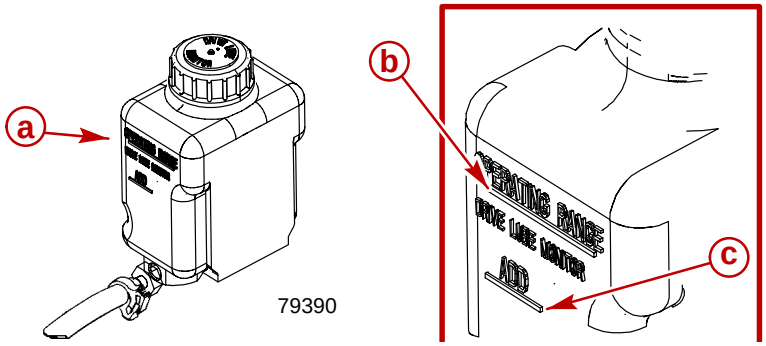
⚠ CAUTION

ENVIRONMENTAL HAZARD! Discharge of oil or oil waste into the environment is restricted by law. Do NOT spill oil or oil waste into the environment when using or servicing your boat. Contain and dispose of oil or oil waste as defined by local authorities.

Checking

NOTE: *Oil level will rise and fall during operation. Oil level should be checked with the engine cold, before starting.*

1. Check the gear lube oil level. Keep the oil level at or near the “OPERATING RANGE” (full) line on the gear lube monitor.
2. The oil level is low if it is below the “ADD” line on the gear lube monitor. Fill as necessary with the specified fluid. Refer to **Filling**.



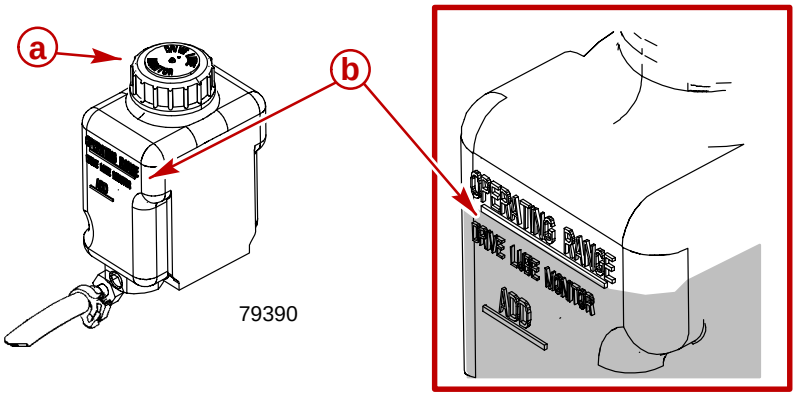
a - Gear lube monitor
b - “OPERATING RANGE” line
c - “ADD” line

IMPORTANT: If any water is visible at the bottom of the monitor or appears at the oil fill/drain plug and/or if oil appears discolored, contact your authorized Cummins MerCruiser Diesel dealer / distributor immediately. Both conditions may indicate a water leak somewhere in the sterndrive unit.

Filling

IMPORTANT: If more than 59 ml (2 fl. oz.) of Quicksilver High Performance Gear Lube is required to fill the monitor, a seal may be leaking. Damage to the sterndrive unit may occur due to lack of lubrication. Contact your authorized Cummins MerCruiser Diesel dealer / distributor.

1. Remove the gear lube monitor cap.
2. Fill the gear lube monitor to the “OPERATING RANGE” (full) line with specified fluid. Do not overfill.



a - Gear lube monitor cap
b - “OPERATING RANGE” line

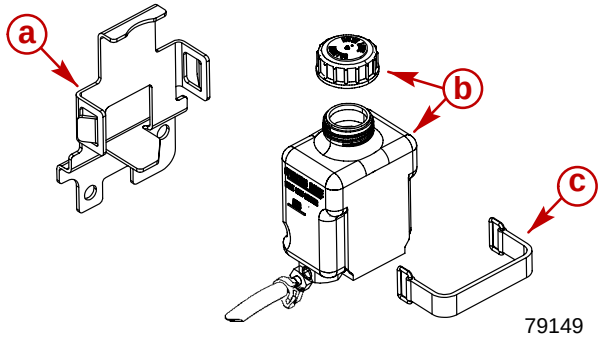
Description	Where Used	Part Number
High Performance Gear Lube	Gear lube monitor	92-802854A1

3. Ensure that the rubber gasket is inside the gear lube monitor cap and install the cap. Do not overtighten.

NOTE: *When filling the entire sterndrive unit refer to* ***Changing*** *instructions.*

Changing

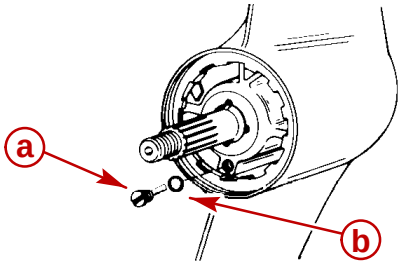
1. Remove the gear lube monitor from the bracket.



Typical

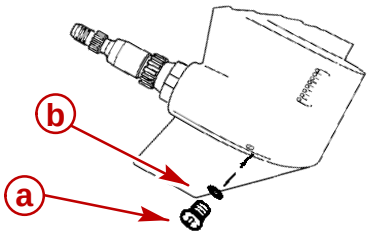
a - Bracket
b - Gear lube monitor and cap
c - Retaining strap

2. Empty the contents into a suitable container.
3. Install the monitor in the bracket.
4. **Bravo One Models:** Remove the propeller, place the sterndrive unit in full trim limit IN position, remove the oil fill/drain screw and sealing washer and drain the oil.



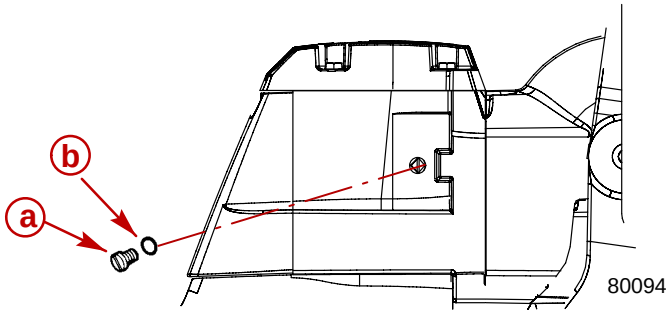
a - Oil fill/drain
b - Sealing washer

5. **All Other Models:** Place the sterndrive unit in full trim limit OUT position, remove the oil fill/drain screw and sealing washer. Drain the oil.



a - Oil fill/drain
b - Sealing washer

6. Remove the oil vent screw and sealing washer. Allow the oil to drain completely.



Typical

a - Oil vent screw
b - Sealing washer

IMPORTANT: If any water drained from the oil fill/drain hole, or if the oil appears milky, the sterndrive unit is leaking and should be checked immediately by your authorized Cummins MerCruiser Diesel dealer / distributor.

7. Lower the sterndrive unit so that the propeller shaft is level. Fill the sterndrive unit, through the oil fill/drain hole, with specified gear lube until an air-free stream of lubricant flows from oil vent hole.

Description	Where Used	Part Number
High Performance Gear Lube	Gear lube monitor	92-802854A1

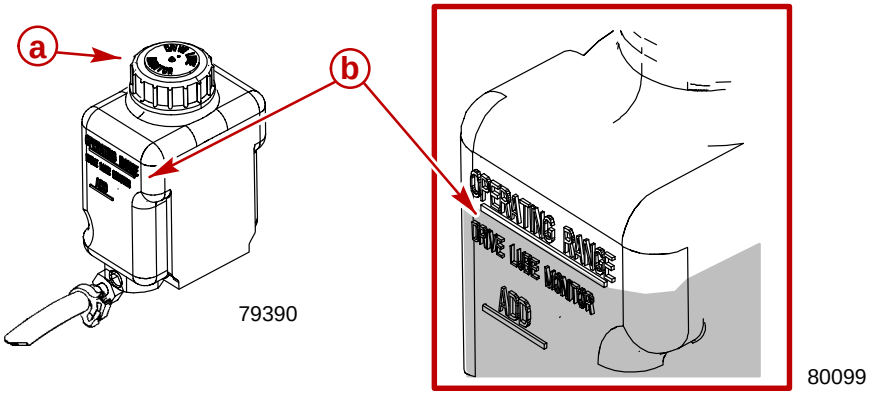
IMPORTANT: Use only Quicksilver High Performance Gear Lube in sterndrive unit.

8. Install the oil vent screw and sealing washer. Torque the oil vent screw.

Description	Nm	lb-in.	lb-ft
Oil vent screw	6.8	60	

9. Continue to pump gear lube into the gear lube monitor circuit until the gear lube appears in the gear lube monitor.

10. Fill the gear lube monitor so that the oil level is in the operating range. Do not overfill.



a - Gear lube monitor cap
b - “OPERATING RANGE” line

Description	Where Used	Part Number
High Performance Gear Lube	Gear lube monitor	92-802854A1

11. Ensure that the rubber gasket is inside the cap and install the cap. Do not overtighten.
12. Remove the pump from the oil fill/drain hole. Quickly install the sealing washer and oil fill/drain screw. Torque the oil fill/drain screw.

Description	Nm	lb-in.	lb-ft
Oil fill/drain screw	6.8	60	

13. Install the propeller. Refer to **Propellers**.
14. Check the oil level in the gear lube monitor after the first use.

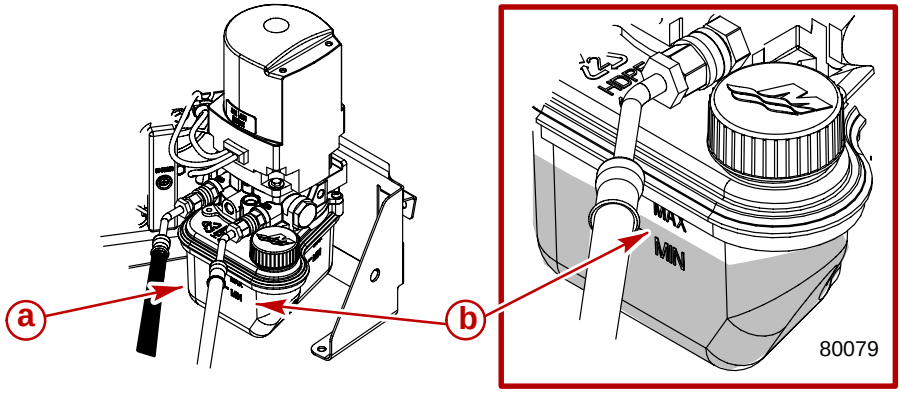
IMPORTANT: Oil level in the gear lube monitor will rise and fall during sterndrive operation; always check the oil level when the sterndrive is cool and the engine is shut down.

Power Trim Pump Fluid

Checking

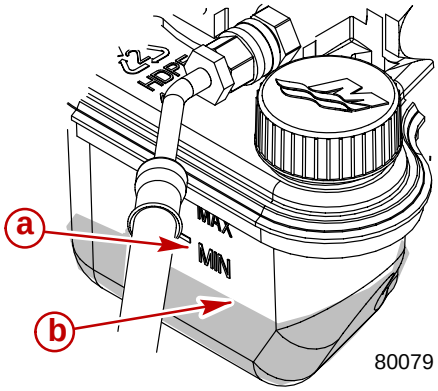
IMPORTANT: Check the oil level with sterndrive unit in the full DOWN/IN position only.

1. Place the sterndrive unit in full DOWN/IN position.
2. Observe the oil level in the reservoir. The oil level should be maintained within the “MIN” and “MAX” lines on the reservoir.



a - Reservoir
b - “MIN” and “MAX” lines

3. The oil level is low if it is below the “MIN” line on the reservoir. Fill as necessary with the specified fluid. Refer to **Filling**.

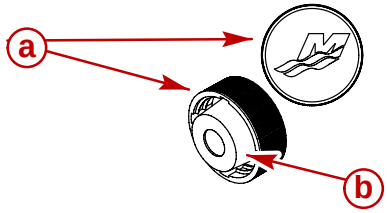


a - “MIN” line
b - Low oil level

Filling

1. Place the sterndrive unit in the full DOWN/IN position.
2. Unscrew and remove the fill cap assembly from the reservoir.

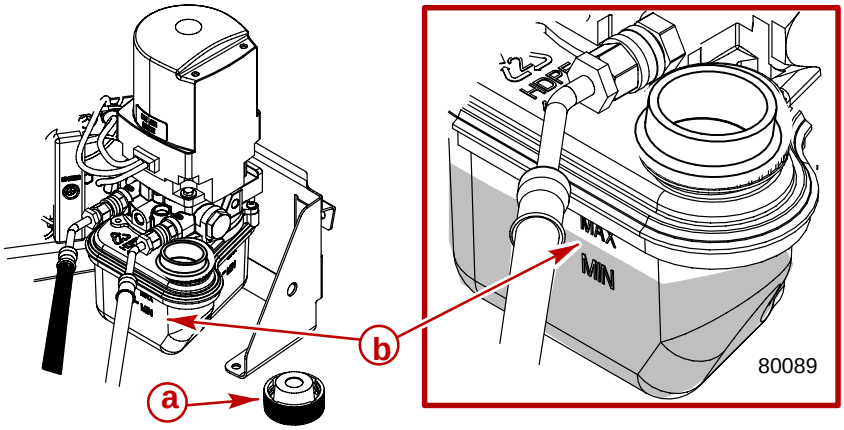
NOTE: *The fill cap and cap vent are an assembled as a unit and should not be separated. Do not remove or discard the cap vent.*



a - Fill cap assembly
b - Cap vent

IMPORTANT: Use only the specified lubricant.

3. Add lubricant to bring the oil level to within the “MIN” and “MAX” lines on the reservoir.



Typical

a - Fill cap assembly
b - “MIN” and “MAX” lines

Description	Where Used	Part Number
Power Trim And Steering Fluid	Power trim pump	92-802880A1

4. Install the fill cap assembly.

Changing

Power Trim fluid does not require changing unless it becomes contaminated with water or debris. Contact your authorized Cummins MerCruiser Diesel dealer/distributor.

Lubrication

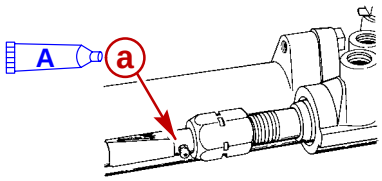
Steering System

⚠ WARNING

Do not grease steering cable while extended. Hydraulic lock could occur and cause loss of steering control.

1. **If Steering Cable Has Grease Fittings:** Turn steering wheel until steering cable is fully retracted into cable housing. Apply approximately 3 pumps of grease from a typical hand-operated grease gun.

NOTE: *If steering cable does not have grease fitting, inner wire of cable cannot be greased.*

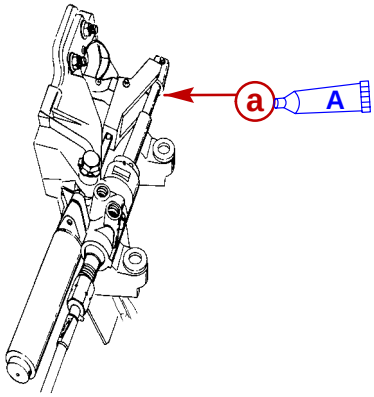


71903

a - Steering cable grease fitting

Description		Where Used	Part Number
A	2-4-C with Teflon	Steering cable	92-802859A1

2. Turn steering wheel until steering cable fully extended. Lightly lubricate the exposed part of cable.

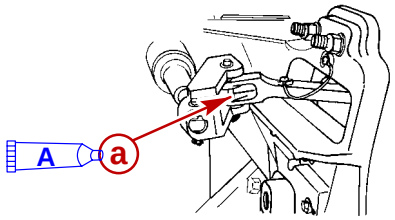


71901

a - Extended steering cable

Description		Where Used	Part Number
A	Special Lubricant 101	Steering cable	92-802865A1

3. Lubricate the steering system pivot points.



71904

a - Steering system pivot points

Description		Where Used	Part Number
A	SAE 30W Engine Oil	Pivot points	Obtain Locally

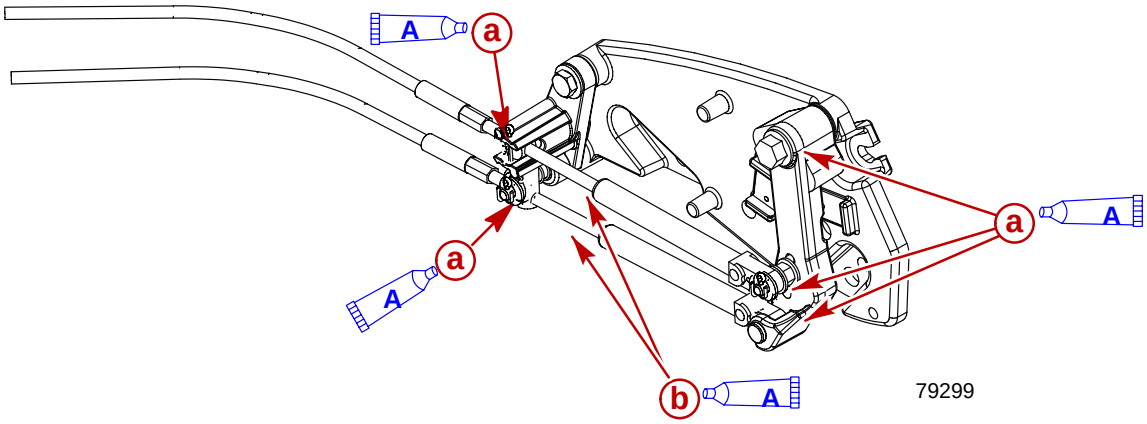
4. On dual engine boats: Lubricate the tie bar pivot points.

Description	Where Used	Part Number
SAE 30W Engine Oil	Pivot points	Obtain Locally

5. Upon first starting engine, turn steering wheel several times to starboard and then port to ensure that the steering system operates properly before getting underway.

Shift Cable - Typical

1. Lubricate the pivot points and the guide contact surfaces.



79299

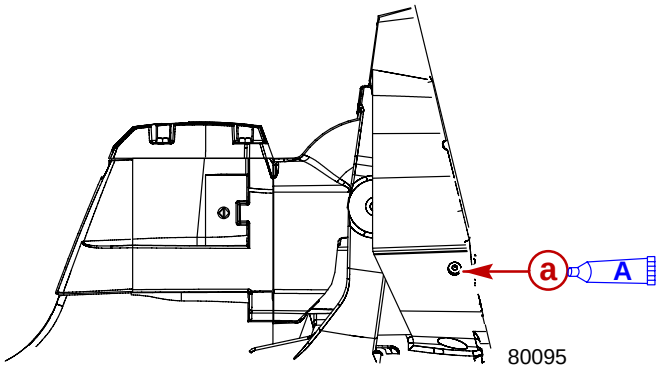
Typical

a - Pivot points
b - Guide contact surfaces

Description		Where Used	Part Number
A	Engine Oil	Pivot points, guide contact surfaces	Obtain Locally

Sterndrive Unit and Transom Assembly

1. Lubricate gimbal bearing by applying approximately 8-10 pumps of grease from a typical hand-operated grease gun.



a - Gimbal bearing grease fitting

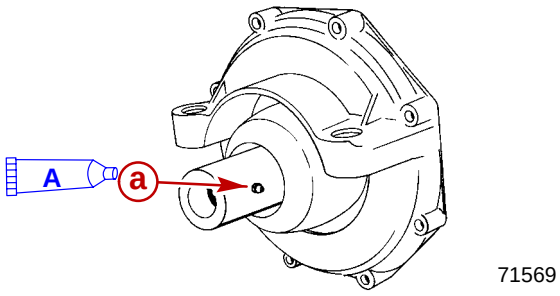
Description		Where Used	Part Number
A	U-joint And Gimbal Bearing Grease	Gimbal bearing	92-802870A1

2. For propeller shaft lubrication, refer to Propeller.

Engine Coupler

NOTE: **Bravo Models** - *Your power package may be equipped with a sealed engine coupler. The sealed coupler and shaft splines can be lubricated without removing the sterndrive unit.*

1. Lubricate the engine coupler splines through the grease fittings, if equipped, on the coupler by applying approximately 8-10 pumps of grease from a typical hand-operated grease gun.



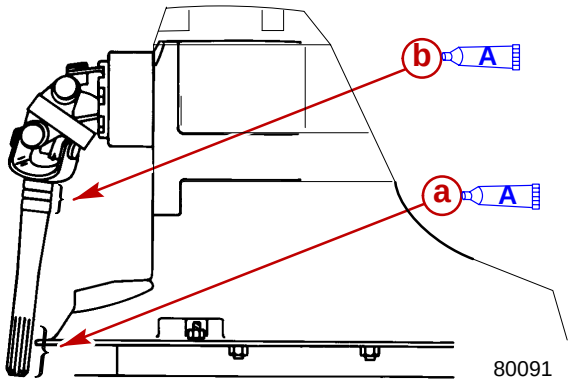
a - Engine coupler grease fitting

Description		Where Used	Part Number
A	Engine Coupler Spline Grease	Coupler	92-802869A1

NOTE: *If the boat is operated at idle for prolonged periods of time, coupler should be lubricated on Bravo Models - every 50 hours.*

Sterndrive U-joint Shaft Splines And O-rings (Sterndrive Unit Removed)

1. Lubricate the U-joint shaft splines and the O-rings.

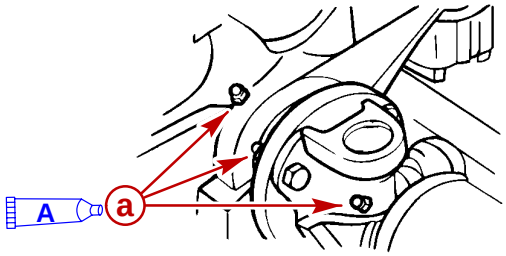


a - U-joint shaft splines
b - U-joint shaft O-rings

Description		Where Used	Part Number
A	Engine Coupler Spline Grease	U-joint shaft splines and O-rings	92-802869A1

Drive Shaft Extension Models

1. Lubricate the drive shaft grease fittings, at the transom end, by applying approximately 10-12 pumps of grease from a typical hand-operated grease gun.

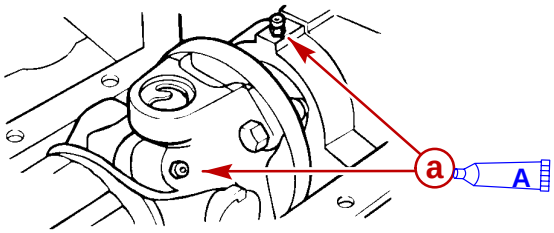


71346

a - Grease fitting locations

Description		Where Used	Part Number
A	U-joint and Gimbal Bearing Grease	Drive shaft U-joints	92-802870A1

2. Lubricate the drive shaft grease fittings, at the engine end, by applying approximately 3-4 pumps of grease from a typical hand-operated grease gun.



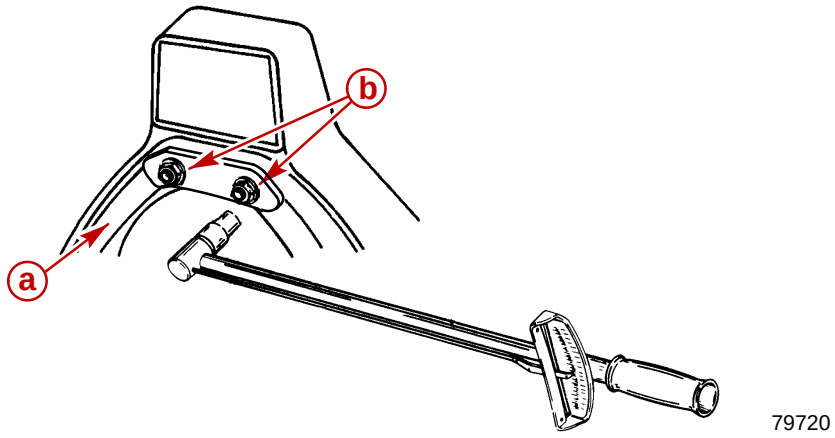
71347

a - Grease fitting locations

Description		Where Used	Part Number
A	U-joint and Gimbal Bearing Grease	Drive shaft U-joints	92-802870A1

Gimbal Ring To Steering Shaft Connection

1. Torque the gimbal ring locknuts for the steering shaft connection.



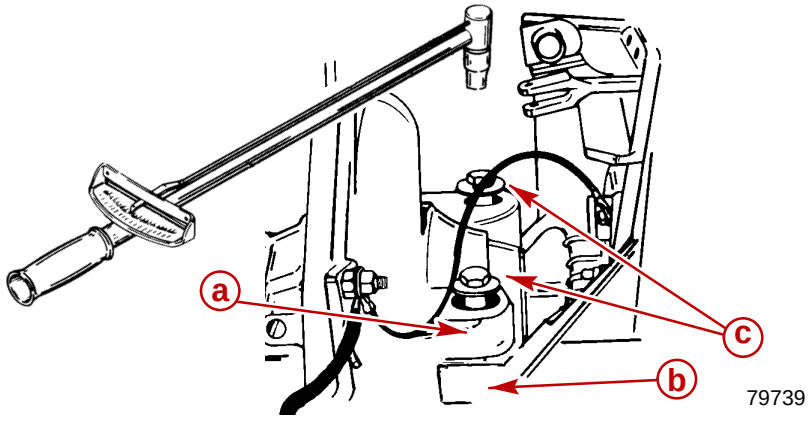
a - Gimbal ring
b - Locknut

Description	Nm	lb-in.	lb-ft
Gimbal ring locknuts	72		53

Rear Engine Mount

NOTE: *Refer to the engine manufacturer for front engine mount information.*

1. Torque the rear engine mount bolts.



Typical

a - Rear engine mount
b - Transom plate mount
c - Bolt

Description	Nm	lb-in.	lb-ft
Rear engine mount bolt	47		35

Propellers

Bravo One and Two

REMOVAL

⚠ WARNING

Avoid Injury: Remote Control must be in NEUTRAL and ignition key removed from switch before removing and/or installing propeller.

⚠ WARNING

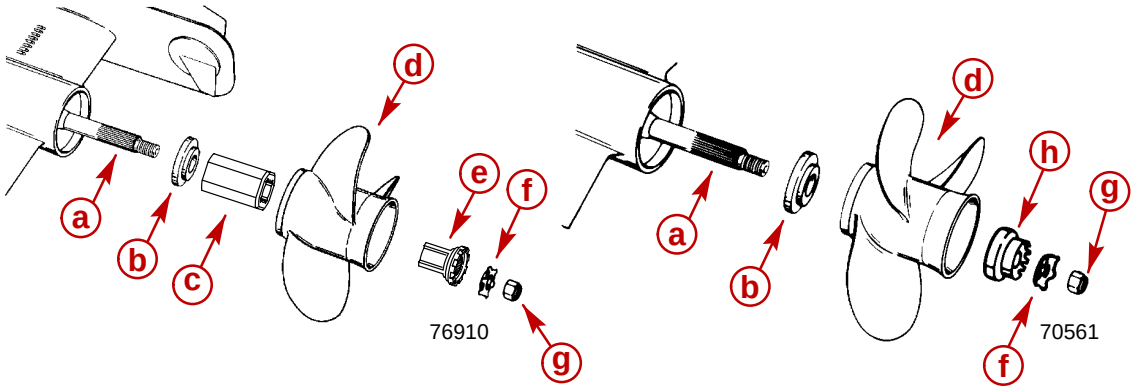
Avoid Injury: Place a block of wood between anti-ventilation plate and propeller to protect hands from propeller blades and to prevent propeller from rotating when removing propeller nut.

1. Place wood block between propeller blade and anti-ventilation plate to prevent rotation. Straighten bent tabs on tab washer.
2. Turn propeller shaft nut counterclockwise to remove nut.
3. Slide tab washer, spline washer, propeller and thrust hub off propeller shaft.

REPAIR

Some damaged propellers can be repaired. Contact your authorized aCummins MerCruiser Diesel dealer / distributor.

INSTALLATION



Bravo One

- **a** - Propeller shaft
- **b** - Thrust hub
- **c** - Flo-Torque II drive hub
- **d** - Propeller

Bravo Two

- **e** - Drive sleeve
- **f** - Tab washer
- **g** - Propeller nut
- **h** - Spline washer

IMPORTANT: If reusing the tab washer, carefully inspect the tabs for cracks or other damage. Replace the tab washer if condition is questionable.

1. Apply a liberal coat of one of the following lubricants to the propeller shaft.

Description	Where Used	Part Number
Anti-Corrosion Grease	Propeller shaft	92-802867A1
Special Lubricant 101		92-802865A1
2-4-C with Teflon		92-802859A1

2. Slide thrust hub into propeller hub with stepped side toward propeller hub.
3. **Bravo One:** Install Flo-Torque II Drive Hub into propeller.

NOTE: *The drive sleeve is tapered and will slide fully into the propeller as the nut is tightened and properly torqued.*

4. Align splines and place propeller on propeller shaft.
5. Install final attaching hardware.
   a. **Bravo One:** Install drive sleeve adapter and locking tab washer.
   b. **Bravo Two:** Install spline washer and tab washer.

⚠ CAUTION

Avoid Injury: Periodically check propeller nut for tightness during boating season. A minimum of 75 Nm (55 lb-ft) torque is required.

6. Install and torque the propeller nut.

Description	Nm	lb-in.	lb-ft
Propeller Nut[1]	75		55

[1] The propeller torque stated is the minimum torque value.

7. Bend 3 tabs on the tab washer down into the grooves in spline washer. After the first use, bend the 3 tabs straight and retorque the propeller nut. Bend tabs back down into spline washer. Check propeller at least after 20 hours of operation. Do not operate with a loose propeller.

Bravo Three

REMOVAL

⚠ WARNING

Avoid Injury: Remote Control must be in NEUTRAL and ignition key removed from switch before removing and/or installing propeller.

⚠ WARNING

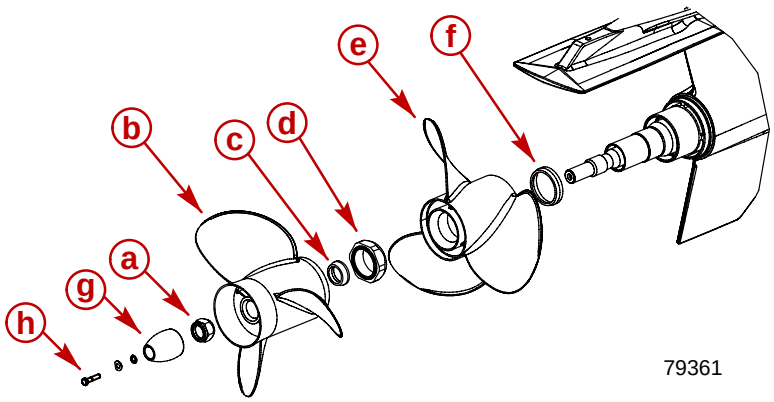
Avoid Injury: Place a block of wood between anti-ventilation plate and propeller to protect hands from propeller blades and to prevent propeller from rotating when removing propeller nut.

1. Place wood block between propeller blades and anti-ventilation plate to prevent rotation.
2. Turn aft propeller shaft nut (1-7/16 in. or 37 mm) COUNTERCLOCKWISE to remove nut.
3. Slide propeller and thrust hub off propeller shaft.
4. Turn front propeller shaft nut (2-3/4 in. or 70 mm) COUNTERCLOCKWISE to remove nut.
5. Slide propeller and thrust hub off propeller shaft.

REPAIR

Some damaged propellers can be repaired. Contact your authorized Cummins MerCruiser Diesel dealer.

INSTALLATION



Bravo Three

- **a** - Rear propeller nut
- **b** - Rear propeller
- **c** - Rear propeller thrust hub
- **d** - Front propeller nut
- **e** - Front propeller
- **f** - Front propeller thrust hub
- **g** - Propeller shaft anode
- **h** - Propeller shaft anode screw and washers

1. Apply a liberal coat of one of the following lubricants to the propeller shaft.

Description	Where Used	Part Number
Anti-Corrosion Grease	Propeller shaft	92-802867A1
Special Lubricant 101		92-802865A1
2-4-C with Teflon		92-802859A1

2. Slide forward thrust hub onto propeller shaft with tapered side toward propeller hub (toward end of shaft).
3. Align splines and place propeller on propeller shaft.
4. Install and torque the propeller nut. Check propeller at least every 20 hours of operation and retorque as needed.

Description	Nm	lb-in.	lb-ft
Forward Propeller Nut	136		100

5. Slide aft thrust hub onto propeller shaft, with tapered side toward propeller hub (toward end of shaft).
6. Align splines and place propeller on propeller shaft.

⚠ CAUTION

Avoid Injury: Periodically check propeller nut for tightness during boating season. A minimum of 81 Nm (60 lb-ft) torque is required.

7. Install and torque the propeller nut. Check propeller at least every 20 hours of operation and retorque as needed.

Description	Nm	lb-in.	lb-ft
Aft Propeller Nut	81		60

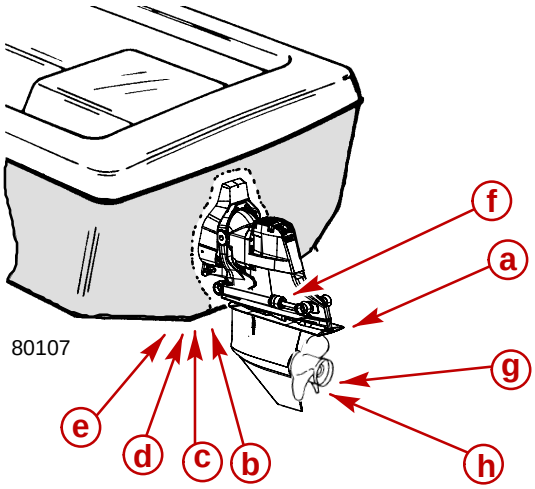
8. Install propeller shaft anode screw with washers. Torque the screw.

Description	Nm	lb-in.	lb-ft
Propeller shaft anode screw	19	168	

Corrosion Protection

Whenever 2 or more dissimilar metals (like those found on the sterndrive) are submerged in a conductive solution, such as saltwater, polluted water or water with a high mineral content, a chemical reaction takes place causing electrical current to flow between metals. The electrical current flow causes the metal that is most chemically active, or anodic, to erode. This is known as galvanic corrosion and, if not controlled, it will in time cause the need for replacement of power package components exposed to water.

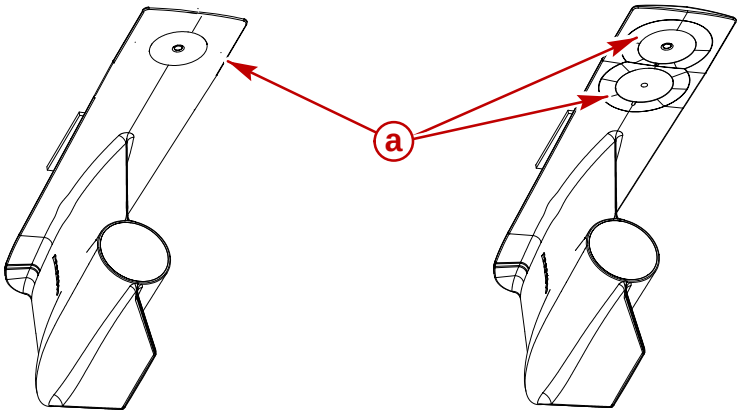
To help control the effects of galvanic corrosion, Cummins MerCruiser Diesel sterndrive units come with several sacrificial anodes and other corrosion protection devices. For a more comprehensive explanation of corrosion and corrosion protection refer to the ***Marine Corrosion Protection Guide*** (90-88181301).



a - Gearcase anodic plate
b - Ventilation Plate Anode
c - Drive mounted anodic block
d - MerCathode system
e - Anode kit
f - Trim cylinder anodes
g - Bearing carrier anode
h - Propshaft anode

IMPORTANT: Replace sacrificial anodes if eroded 50 percent or more.

Gearcase Anodic Plate - Is mounted on the underside of the lower gearcase and serves as a sacrificial anode.



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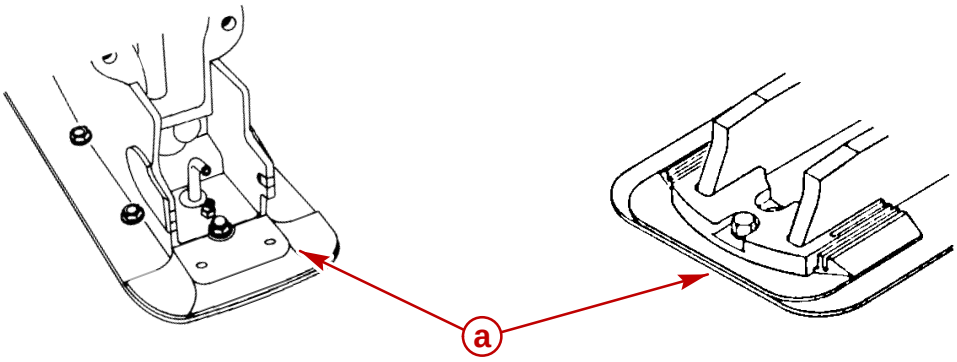
Alpha, Bravo One and Bravo Two Models **Bravo Three Models**

a - Anode

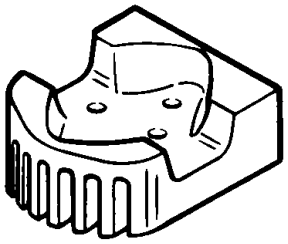
Ventilation Plate Anode - Is mounted on the front of the gearcase and serves as a sacrificial anode.



Alpha Models **All Bravo Models**

a - Anode

Drive Mounted Anodic Block (if equipped) - Is mounted to underside of gimbal housing and serves as a sacrificial anode.



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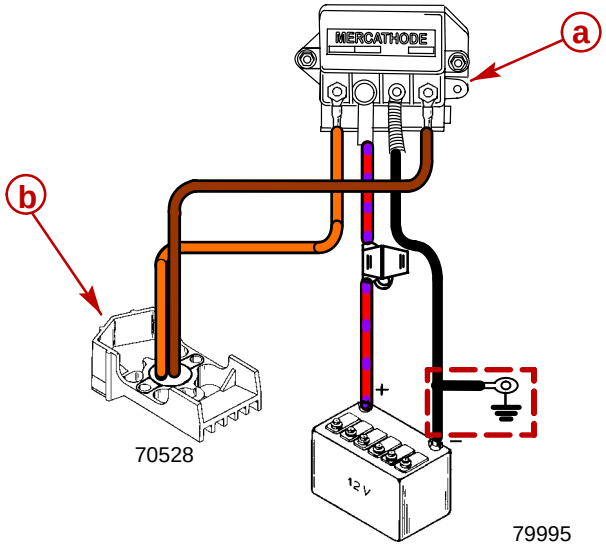
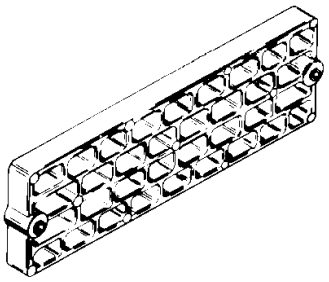
MerCathode System (if equipped) - Electrode assembly replaces Anodic Block. System should be tested to ensure adequate output. The test should be performed where boat is moored, using Quicksilver Reference Electrode and Test Meter. Contact your authorized Cummins MerCruiser Diesel dealer / distributor.



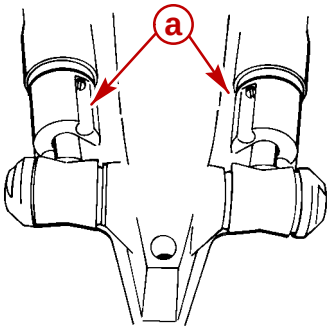
Typical

a - MerCathode controller
b - Anodic block

Anode Kit (if equipped) - Mounted to boat transom. Acts as a sacrificial anode.



Trim Cylinder Anodes - are mounted on each trim cylinder.



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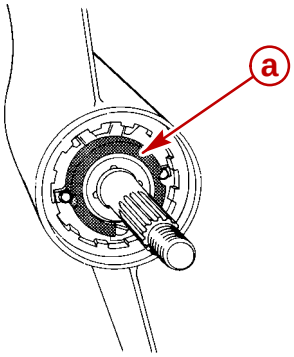
a - Trim cylinder anodes

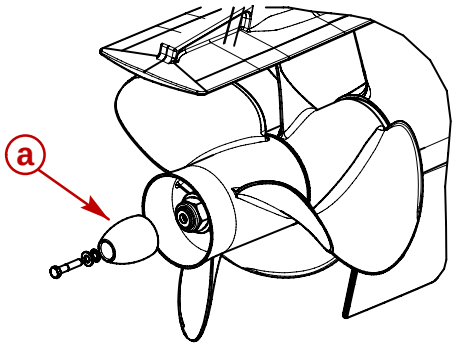
Bearing Carrier Anode (Alpha and Bravo One Models) - is located in front of the propeller, between the front side of the propeller and the gear housing.



72032

a - Bearing carrier anode

Propshaft Anode (Bravo Three Only) - is located behind the aft propeller.



79161

a - Propshaft anode

In addition to the corrosion protection devices, the following steps should be taken to inhibit corrosion:

1. Paint your power package, refer to **Painting Your Power Package**.
2. Spray power package components on inside of boat annually with Corrosion Guard to protect finish from dulling and corrosion. External power package components may also be sprayed.
3. All lubrication points, especially steering system, shift and throttle linkages, should be kept well lubricated.
4. Flush cooling system periodically, preferably after each use.

Painting Your Power Package

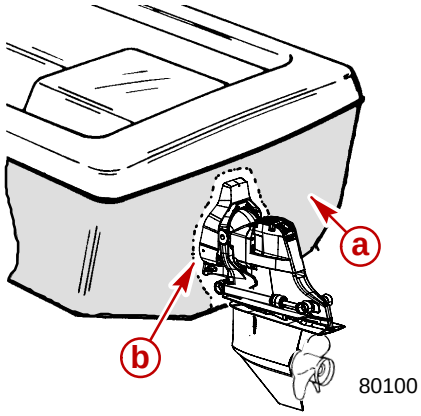
IMPORTANT: Corrosion damage that results from the improper application of anti-fouling paint will not be covered by the limited warranty.

Painting Boat Hull or Boat Transom: Anti-fouling paint may be applied to boat hull and boat transom but you must observe the following precautions:

IMPORTANT: Do not paint anodes or MerCathode System reference electrode and anode, as this will render them ineffective as galvanic corrosion inhibitors.

IMPORTANT: If anti-fouling protection is required for boat hull or boat transom, copper base paint, if not prohibited by law, can be used. If using copper or tin based anti-fouling paint, observe the following:

- **Avoid an electrical interconnection between the Mercury MerCruiser Product, Anodic Blocks, or MerCathode System and the paint by allowing a minimum of 40 mm (1-1/2 in.) UNPAINTED area on transom of the boat around these items.**



a - Painted boat transom
b - Minimum 40 mm (1-1/2 in.) unpainted area around transom assembly

NOTE: *Sterndrive unit and transom assembly can be painted with a good quality marine paint or an anti-fouling paint that does not contain copper or any other material that could conduct electrical current. Do not paint drain holes, anodes, MerCathode system or items specified by boat manufacturer.*

NOTE: *Do not wash the sterndrive unit with a power washer as this can damage the coating on the reference wire and increase corrosion.*

NOTES:

SECTION 6 - STORAGE

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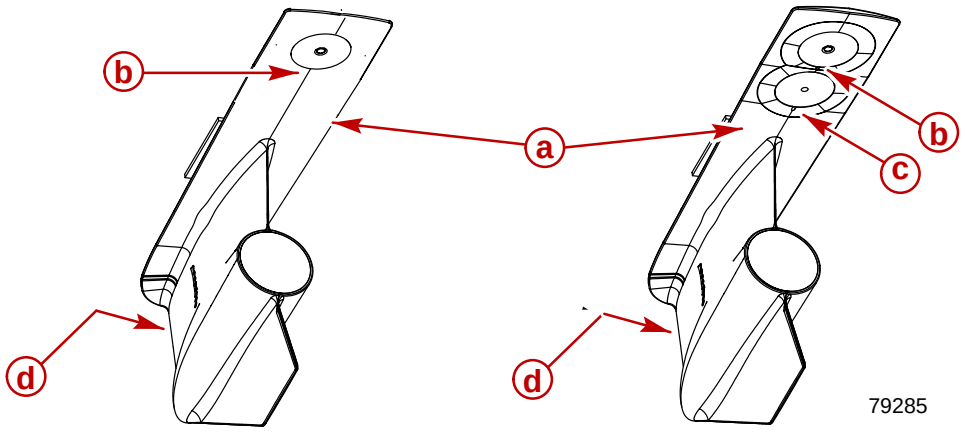
Cold Weather (Freezing Temperature), Seasonal, And Extended Storage

IMPORTANT: Cummins MerCruiser Diesel strongly recommends that this service should be performed by an authorized Cummins MerCruiser Diesel dealer / distributor. Damage caused by freezing IS NOT covered by the Cummins MerCruiser Diesel Limited Warranty.

Sterndrive Unit Lay Up

1. Using a piece of wire, check the water drain passages in the sterndrive unit to ensure that they are open.



Bravo One, Brave Two, and early Bravo Three models

All late Bravo Three models

a - Under side of prop shaft housing
b - First anode cavity drain passage
c - Second anode cavity drain passage
d - Speedometer pitot tube

2. Change the sterndrive unit oil and check the sterndrive unit for water. Refer to **Section 5 - Sterndrive Unit Oil, Changing**. Water in the drive unit can cause damage to your drive unit and may indicate a water leak. If any water is present, contact your authorized Cummins MerCruiser Diesel dealer / distributor.
3. Perform all other checks, inspections, lubrication, and fluid changes outlined in Maintenance Chart under Every 100 hours or annually.

⚠ CAUTION

The sterndrive unit should be stored in the FULL DOWN / IN position. The universal joint bellows may develop a set if the unit is stored in the raised position and may fail when the unit is returned to service.

4. Place sterndrive unit in the full DOWN / IN position.

Sterndrive Unit Recommissioning

1. Carefully inspect the sterndrive unit for leaks.
2. Check the steering system, shift and throttle control for proper operation.

TROUBLESHOOTING

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Remote Control Operates Hard, Binds, Has Excessive Free-play Or Makes Unusual Sounds

Possible Cause	Remedy
Insufficient lubrication on shift and throttle linkage fasteners.	Lubricate.
Obstruction in shift or throttle linkages.	Remove obstruction.
Loose or missing shift and throttle linkages.	Check all throttle linkages. If any are loose or missing, see an authorized Cummins MerCruiser Diesel dealer / distributor immediately.
Shift or throttle cable kinked.	Straighten cable or have an authorized Cummins MerCruiser Diesel dealer / distributor replace cable if damaged beyond repair.
Vacuum leak at shift cylinder, hose or fittings of Power Shift Assembly, if so equipped.	Repair cut, pinched, or kinked hose. Repair faulty shift cylinder. or see an authorized Cummins MerCruiser Diesel dealer / distributor.

Steering Wheel Turns Hard Or Jerky

Possible Cause	Remedy
Low power steering pump fluid level.	Check for leak. Refill system with fluid.
Drive belt loose or in poor condition.	Replace and/or adjust.
Insufficient lubrication on steering components.	Lubricate.
Insufficient lubrication on transom gimbal housing assembly and swivel shaft.	Lubricate.
Loose or missing steering fasteners or parts.	Check all parts and fasteners if any are loose or missing, see an authorized Cummins MerCruiser Diesel dealer / distributor immediately.
Contaminated power steering fluid.	See an authorized Cummins MerCruiser Diesel dealer / distributor.

Power Trim Does Not Operate (Electric Motor Does Not Operate)

Possible Cause	Remedy
Blown fuse.	Replace fuse.
Loose or dirty electrical connections or damaged wiring.	Check all associated electrical connections and wires (especially battery cables). Clean and tighten faulty connection. Repair or replace wiring.

Power Trim Does Not Operate (Electric Motor Operates But Sterndrive Unit Does Not Move)

Possible Cause	Remedy
Trim pump oil level low.	Fill pump with oil.
Drive unit binding in gimbal ring.	Check for obstruction. See an authorized Cummins MerCruiser Diesel dealer / distributor.

NOTES:

CUSTOMER ASSISTANCE INFORMATION

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Owner Service Assistance

Local Repair Service

Always return your Cummins MerCruiser Diesel (CMD®) powered boat to your authorized dealer should the need for service arise. Only he has the factory trained mechanics, knowledge, special tools and equipment and the genuine Quicksilver parts and accessories* to properly service your engine should the need occur. He knows your engine best.

* Quicksilver parts and accessories are engineered and built especially for Cummins MerCruiser Diesel sterndrives and inboards.

Service Away From Home

If you are away from your local dealer and the need arises for service, contact the nearest authorized dealer. Refer to the Yellow Pages of the telephone directory or by using the service locator on the Cummins website (www.Cummins.com). . If, for any reason, you cannot obtain service, contact the nearest Regional Service Center. Outside the United States and Canada, contact the nearest Marine Power International Service Center.

Stolen Power Package

If your power package is stolen, immediately advise the local authorities and Cummins MerCruiser Diesel of the model and serial number(s) and to whom the recovery is to be reported. This information about the stolen motor is placed into a file at Cummins MerCruiser Diesel to aid authorities and dealers / distributors in recovery of stolen motors.

Attention Required After Submersion

1. Before recovery contact an authorized Cummins MerCruiser Diesel dealer / distributor.
2. After recovery, immediate service by an authorized Cummins MerCruiser Diesel dealer / distributor is required to prevent serious damage to power package.

Replacement Service Parts

⚠ WARNING

Electrical, ignition and fuel system components on Cummins MerCruiser Diesel Engines and Sterndrives are designed and manufactured to comply with U.S. Coast Guard Rules and Regulations to minimize risks of fire or explosion.

Use of replacement electrical, ignition or fuel system components, which do not comply to these rules and regulations, could result in a fire or explosion hazard and should be avoided.

When servicing the electrical, ignition and fuel systems, it is extremely important that all components are properly installed and tightened. If not, any electrical or ignition component opening would permit sparks to ignite fuel vapors from fuel system leaks, if they existed.

Marine engines are expected to operate at or near full throttle for most of their life. They are also expected to operate in both fresh and saltwater environments. These conditions require numerous special parts. Care should be exercised when replacing marine engine parts, as specifications are quite different from those of the standard automotive engine.

Since marine engines must be capable of running at or near maximum rpm much of the time, special pistons, camshafts and other heavy-duty moving parts are required for long life and peak performance.

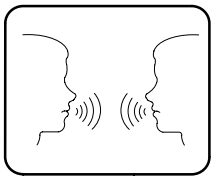
These are but a few of the many special modifications that are required in Cummins MerCruiser Diesel marine engines to provide long life and dependable performance.

PARTS AND ACCESSORIES INQUIRIES

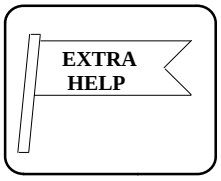
All inquiries concerning Quicksilver replacement parts and accessories should be directed to your local authorized dealer. The dealer has the necessary information to order parts and accessories for you should he not have them in stock. Only authorized dealers can purchase genuine Quicksilver parts and accessories from the factory. Cummins MerCruiser Diesel does not sell to unauthorized dealers or retail customers. When inquiring on parts and accessories, the dealer requires the **sterndrive model, engine model,** and **serial numbers** to order the correct parts.

Resolving A Problem

Satisfaction with your Cummins MerCruiser Diesel product is very important to your dealer and to us. If you ever have a problem, question or concern about your power package, contact your dealer or any authorized Cummins MerCruiser Diesel dealer or distributor. If additional assistance is required, take these steps:



1. Talk with the dealership's sales manager or service manager. If this has already been done, then contact the owner of the dealership.



2. Should you have a question, concern or problem that cannot be resolved by your dealership, please contact your local distributor of Cummins MerCruiser Diesel products for assistance. The distributor will work with you and your dealership to resolve all problems.

The following information will be needed by the service office:

- Your name and address
- Daytime telephone number
- Model and serial numbers for your power package
- The name and address of your dealership
- Nature of problem

The distributor for your area can be found by using the service locator on the Cummins website (www.Cummins.com) or by contacting CMD sales or service listed in the Yellow Pages of the telephone directory.

Customer Service Literature

English Language

English language publications are available from:

Mercury Marine
Attn: Publications Department
W6250 West Pioneer Road
P.O. Box 1939
Fond du Lac, WI 54935-1939

Outside the United States and Canada, contact the nearest Mercury Marine or Marine Power International Service Center for further information.

When ordering be sure to:

- List your product, model, year and serial numbers.
- Check the literature and quantities you want.
- Enclose full remittance in check or money order (NO COD).

Other Languages

To obtain an Operation, Maintenance, and Warranty Manual in another language, contact the nearest Mercury Marine or Marine Power International Service Center for information. A list of part numbers for other languages is provided with your power package.

Andre sprog

Kontakt det nærmeste Mercury Marine eller Marine Power International servicecenter for oplysninger om hvordan du kan anskaffe en Betjenings– og vedligeholdelsesmanual på et andet sprog. En liste med reservedelsnumre for andre sprog leveres sammen med din power–pakke.

Andere talen

Voor het verkrijgen van een Handleiding voor gebruik en onderhoud in andere talen dient u contact op te nemen met het dichtstbijzijnde internationale servicecentrum van Mercury Marine of Marine Power voor informatie hierover. Een lijst met onderdeelnummers voor andere talen wordt bij uw motorinstallatie geleverd.

Muut kielet

Saadaksesi Käyttö– ja huolto–ohjekirjoja muilla kielillä, ota yhteys lähimpään Mercury Marine tai Marine Power International huoltokeskukseen, josta saat lähempiä tietoja. Moottorisi mukana seuraa monikielinen varaosanumeroluettelo.

Autres langues

Pour obtenir un Manuel d’utilisation et d’entretien dans une autre langue, contactez le centre de service après–vente international Mercury Marine ou Marine Power le plus proche pour toute information. Une liste des numéros de pièces en d’autres langues accompagne votre bloc–moteur.

Andere Sprachen

Um eine Betriebs– und Wartungsanleitung in einer anderen Sprache zu erhalten, wenden Sie sich an das nächste Mercury Marine oder Marine Power International Service Center. Eine Liste mit Teilenummern für Fremdsprachen ist im Lieferumfang Ihres Motors enthalten.

Altre lingue

Per ottenere il manuale di funzionamento e manutenzione in altra lingua, contattate il centro assistenza internazionale Mercury Marine o Marine Power più vicino. In dotazione con il gruppo motore, viene fornito l'elenco dei codici prodotto dei componenti venduti all'estero.

Andre språk

Ytterligere informasjon om bruks– og vedlikeholdshåndbok på andre språk kan fås ved henvendelse til nærmeste internasjonale servicecenter for Mercury Marine eller Marine Power. En liste over delenumre for andre språk følger med aggregatet.

Outros Idiomas

Para obter um Manual de Operação e Manutenção em outro idioma, contate o Centro de Serviço Internacional de "Marine Power" (Potência Marinha) ou a Mercury Marine mais próxima para obter informações. Uma lista de números de referência para outros idiomas é fornecida com o seu pacote de propulsão.

Otros idiomas

Para obtener un Manual de operación y mantenimiento en otro idioma, póngase en contacto con el centro de servicio más cercano de Mercury Marine o Marine Power International para recibir información. Con su conjunto motriz se entrega una lista de los números de pieza para los otros idiomas.

Andra språk

För att få Instruktions– och underhållsböcker på andra språk, kontakta närmaste Mercury Marine eller Marine Power International servicecenter, som kan ge ytterligare information. En förteckning över artikelnummer på andra språk medföljer ditt kraftpaket.

Αλλες γλώσσες

Για να αποκτήσετε ένα Εγχειρίδιο Λειτουργίας και Συντήρησης σε άλλη γλώσσα, επικοινωνήστε με το πλησιέστερο Διεθνές Κέντρο Σέρβις της Mercury Marine ή της Marine Power για πληροφορίες. Το πακέτο ισχύος σας συνοδεύεται από έναν κατάλογο αριθμών παραγγελίας για άλλες γλώσσες.

Ordering Literature

Before ordering literature, please have the following information about your power package available:

Model _____ **Horsepower**_____
Serial Number_____ **Year**_____

United States and Canada

For information on additional literature that is available for your particular Cummins MerCruiser Diesel power package and how to order that literature contact your nearest Cummins MerCruiser Diesel dealer / distributor or contact:

Mercury Marine

Telephone	Fax	Mail
(920) 929–5110	(920) 929-4894	Mercury Marine Attn: Publications Department P.O. Box 1939 Fond du Lac, WI 54935-1939

Outside The United States and Canada

Contact your nearest authorized Cummins MerCruiser Diesel dealer / distributor or Marine Power Service Center for information on additional literature that is available for your particular Cummins MerCruiser Diesel power package and how to order that literature.

NOTES: